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CONTENTS OF VOLUME I

PAGE

Materials for the Physical Anthropology of the Eastern European Jews. MAURICE FISHBERG 1

Tribes of the Columbia Valley and the Coast of Washington and Oregon. ALBERT BUELL LEWIS 147

Historical Jottings on Amber in Asia. BERTHOLD LAUFER 211

The Numerical Proportions of the Sexes at Birth. JOHN BENJAMIN NICHOLS 245

Ethnographic and Linguistic Notes on the Paez Indians of Tierra Adentro, Cauca, Colombia. HENRY PITTIER DE FÁBREGA. (PLATES I–IX.) 301

The Cheyenne Indians. JAMES MOONEY. (PLATES X–XII.) 357

Sketch of the Cheyenne Grammar. RODOLPHE PETTER 443

Index 479

MATERIALS FOR THE PHYSICAL ANTHROPOLOGY OF THE EASTERN EUROPEAN JEWS

BY

MAURICE FISHBERG

CONTENTS

	PAGE
I. Introduction	5
The Racial Purity of the Jews	6
Physical Anthropology of the Jews	10
Method of Investigation of the American Jews	18
II. Stature	21
The Influence of Social Conditions on Stature	39
Stature of Women	45
III. The Girth of the Chest	50
IV. The Head	57
Length of the Head	57
Length of the Head of the Women	62
Width of the Head	64
Width of the Head of the Women	68
The Cephalic Index	70
The Cephalic Index of the Women	85
The Horizontal Circumference of the Head	92
V. The Face	95
The Facial Index	98
VI. The Nose	99
Height of the Nose	99
Width of the Nose	101
The Nasal Index	103
The Shape of the Nose	107
VII. Pigmentation	111
VIII. The Combination of Traits into Types	130
IX. Conclusion	135
Bibliography	141

MATERIALS FOR THE PHYSICAL ANTHROPOLOGY OF THE EASTERN EUROPEAN JEWS

By MAURICE FISHBERG

CHAPTER I[1]

Introduction

The study of the somatic characteristics of the Jews has received the attention of many anthropologists in Europe. It was suggested that because they have kept themselves socially isolated for nearly two-thousand years, and have refrained from intermarriage with other races, the Jews offer a promising field for the solution of many obscure problems in the study of man. Considering that they have been scattered over almost every part of the habitable globe; by involuntary and mostly forced migrations from city to city, country to country and from continent to continent, have been subjected to frequent changes in their physical environment, it was expected that a thorough study of their racial characteristics might contribute to our meager knowledge of the influence of environment on race. If the Jews have really maintained themselves for the last four thousand years in absolute purity, the effects of climate, altitude, nourishment, and economic and social conditions should be ascertainable by a study of their physical organization. If, on the other hand, they have intermarried with the races among which

[1] The difficulties encountered while attempting to reach people willing to submit to anthropometric measurements are well known to every one who studied physical anthropology on the living. I therefore gratefully acknowledge the valuable assistance rendered me by Lee K. Frankel, Ph.D., Manager of the United Hebrew Charities of New York City, by affording me the opportunity to obtain anthropometric measurements in connection with my work as medical examiner to the Charities. Without Dr. Frankel's assistance this work could not have been done. I am also under obligations to Prof. Franz Boas for his valuable advice and suggestions during the preparation of the work. To Mr. Joseph Jacobs I am sincerely indebted for reading and revising the manuscript and proofs.

they have dwelt, or if extensive conversions to Judaism have taken place, and the modern Jews are thus a mixture of various racial elements, blended together in a more or less homogeneous group of people, they should offer excellent material for the study of the effects of racial intermixture on the physical organization of man.

There are very few anthropological data on the somatology of *pure* races. In fact we do not know of any *absolutely* pure races in existence. Migration, war, and conquest have always been at work amalgamating various racial elements. But there are also very few data upon the effects of racial intermixture. The present writer is acquainted only with the investigations of Professor Franz Boas of the American half-breeds [1] and Mainoff's work on the intermixture of Russians with Yakouts.[2] Both of these investigations have conclusively shown that the tape and calipers may be of great service in the search for the origin of certain physical traits. If conversions to Judaism and open or clandestine intermarriage between Jews and non-Jews have taken place, it is of scientific interest to ascertain, if possible, the effects of such intermarriage on the physical characteristics of the modern Jews.

The Racial Purity of The Jews

Up to recent time two diametrically opposed views were held by anthropologists on the question of the purity of the Jewish race. Some have maintained that the Jews have preserved themselves in there original purity for the last four thousand years.[3] Richard Andree points out that the racial types represented on the ancient Assyrian and Egyptian monuments prove beyond doubt the constancy of the Jewish type. A look at the Jews painted on these monuments makes one believe that he sees the typical Jew of to-day. "No other race but the Jews," says Andree, "can be traced with such certainty backward for

[1] "Zur Anthropologie der nordamerikanischen Indianer," *Verhandl. der Berliner Anthropologischen Gesellschaft*, 1895, pp. 367–411.

[2] I. I. Mainoff, "Pomes russkikh s yakutami," *Russian Anthropol. Journal*, 1900, No. 4, pp. 37–57.

[3] Milne Edwards, Prichard, Nott and Gliddon, and others.

thousands of years, and no other race displays such a constancy of form, none resisted to such an extent the effects of time, as the Jews. Even when he adopts the language, dress, habits, and customs of the people among whom he lives, he still remains everywhere the same. All he adopts is but a cloak, under which the eternal Hebrew survives ; he is the same in his facial features, in the structure of his body, his temperament, his character."[1] Joseph Jacobs, who studied the question both from the anthropological and the historical standpoint is "inclined to support the long standing belief in the substantial purity of the Jewish race, and to hold that the vast majority of contemporary Jews are the lineal descendants of the diaspora of the Roman empire."[2]

This view was materially changed during the last thirty years, after anthropological investigations of several thousand Jews by modern methods had been published. It is the prevailing opinion at present that the Jews have not maintained their racial purity to the extent indicated by the authors just quoted. All, even those who speak of the subject from a sentimental standpoint, agree that there are two types of Jews, who are said to present physically distinct characteristics. They are the *Ashkenazim*, or German, Russian, and Polish Jews, and the *Sephardim*, the Spanish and Portuguese Jews.[3] Vogt, in his

[1] Richard Andree, "Zur Volkskunde der Juden," Leipzig, 1881, pp. 24–25.

[2] Joseph Jacobs, "On the Racial Characteristics of Modern Jews," *Journal Anthropol. Institute*, XV, 1885, p. 53.

[3] The European Jews are divided into two main groups, *Ashkenazim* and *Sephardim*. The former constitute about ninety percent of the modern Jews, while the latter are only about ten percent. *Ashkenazim* has its origin in *Ashkenaz*, the son of Gomer, grandson of Japhet, and great-grandson of Noah (Gen. X, 3 ; I Chron. I, 6.). The Talmud and also mediæval rabbinical literature identify Ashkenaz with Germany and Teutons, while according to Saadia, the Slavs are meant (Jewish Encyclopedia, Vol. II, pp. 191–193). At present all the Jews from Germany, Poland, Russia, and Austria are called Ashkenazim partly because of the "Yiddish" or German jargon which most of them employ. The name *Sephardi* has its origin in *Sepharad*, the Biblical name of an unknown land into which the Jews exiled from Jerusalem were brought (see *Abadias*, 20). The mediæval rabbis believed that Sepharad referred to Spain and Portugal ; hence the name Sephardim for the Spanish Jews. When banished from Spain in 1492, about 300,000 Jews were dispersed ; some wandered to northern Africa, others to Italy, England, Holland, Turkey, Asia Minor, etc. The remnants of these Jews living at the present

"Lectures on Man," gave an excellent description of these two types. "The first, found mostly in northern Russia and Poland, Germany and Bohemia, are often characterized by red hair, short beard, short concave nose, small gray lustrous eyes; the body is inclined to be stout; the face, round, with broad cheek-bones, is similar to some of the northern Slavonians. On the other hand, in the Orient and around the Mediterranean, and also in Portugal and Holland, are found Jews with long black hair and beard, large almond-shaped black eyes, a melancholy cast of countenance, with a long face and a prominent nose — in short, the type which we find represented in the paintings of Rembrandt."[1] This view was supported by Broca, who stated that in his opinion the Jews are not a pure race, but a mixture of various races. The blond Jews in Alsace-Lorraine and Germany have their origin in intermixture with northern races; in Russia there are evidences of mixture of Jews with Slavonians, Finns and Tartars. The view that there are two racial types of Jews has been shared by many other anthropologists; Stieda, who was the first to investigate the problem in Russia by directing two of his pupils to obtain measurements of Jews in Russia, arrived at a conclusion which is shared by Topinard, Deniker, and Weisbach.[2] Maurer describes in detail the physical traits of two races of Jews living in Bosnia: One, the Turanian type, with prominent cheek bones, with broad mouth

time in the Balkan states, as Bosnia, European Turkey, Roumania, etc., are also known by the name *Spagnuoli*, probably because of the Spanish jargon they still employ. There were many of them in the United States, but they are rapidly disappearing by intermarriage with Ashkenazim, etc. These two groups of Jews differ in their traditions, rites, and physical type. The Sephardim consider themselves as the branch of Israel which has maintained itself to the present day in its original Semitic purity, and kept itself freer from admixture of non-Semitic blood than the Ashkenazim. They refuse to intermarry with the German Jews, have their own synagogues, cemeteries, etc.

[1] Karl Vogt, Vorlesungen über den Menschen, II, p. 238.

[2] See L. Stieda, "Ein Beitrag zur Anthropologie der Juden," *Archiv für Anthropologie*, XIV, pp. 61–71, 1883; B. Blechman, "Ein Beitrag zur Anthropol. der Juden," Dorpat, 1882, Diss.; P. Topinard, "Eléments d'anthropologie générale," Paris, 1886; J. Deniker, "The Races of Men," London, 1900; A. Weisbach, "Körpermessungen verschiedener Menschenrassen," *Zeitschrift für Ethnologie*, Erganzunsband, 1877.

having thin lips; and large jaws. The nose is pear shaped, narrow and depressed at the root. The head is round, the eyes blue, and blond or reddish hair are frequently encountered among them. The other type is said to be possessed of all the traits which characterize the Semites, such as long head, dark hair and eyes, etc.[1]

Other anthropologists have seen in the Jews more than a mixture of two races. C. Ikof, basing his opinion on measurements obtained of 120 Jews in Russia, and 55 Jewish and Karaite skulls derived from Russia, Turkey, Italy, Caucasia, etc., concludes that only the Jews of the Orient and in southern Europe (Balkan states, Spain, Italy, Algiers, Morocco, Tunis, etc.) are of Semitic origin, with only a slight intermixture of other racial elements. The Jews in western Europe are possessed of all the morphological evidences of a strong mixture of Semitic blood with the indigenous populations of these countries. But the Jews in Russia are not Semites at all, because physically they have nothing in common with the latter, and actually belong to an entirely different race.[2] Many others have spoken of the Jews in a similar manner. Lagneau, for instance, denies that there are any Jews of pure race in any part of the world. The German, Polish, and Russian Jews are a mixture of Teutons, Slavonians, and Cossacks. The Jews on the north coast of the Mediterranean are mostly proselytes to Judaism of Hellenic and Latin origin; and the Jews in northern Africa are the result of the intermixture of the Jews who in antiquity resided in Egypt and Carthaginia with the local tribes of Berbers, Kopts, and Phœnicians, later also with Greek and Roman elements, finally, during the middle ages, with the Arabians.[3] Weissenberg also, after an investigation of the physical characteristics of the Jews in southern Russia, refutes the prevailing idea that there is a unity of the Jewish type. He distinguishes the "fine" and the

[1] Franz Maurer, "Mittheilungen aus Bosnien," Das Ausland, 1869, p. 1163.

[2] K. N. Ikof, "Neue Beiträge zur Anthropologie der Juden," *Archiv für Anthropologie*, XV, 1884, pp. 369–389.

[3] G. Lagneau, "Sur la race juive et sa pathologie," *Bull. de la Société d'Anthropologie de Paris*, 1891.

"coarse" Jewish type, and finds also North European, Caucasian, Mongolian, and other types among them. [1]

It is thus seen that most of the modern anthropologists who have studied the physical characteristics of the Jews have strongly discredited the theory of the racial purity of the Jews. Renan aptly said, "il n'y pas un type juif, il y a des types juifs," and "judaisme est une religion, mais n'est pas un fait ethnologique, mais une type accidentel." [2] Professor Ripley, after a most thorough study of the literature of the subject, arrives at the same conclusion.[3]

Physical Anthropology of the Jews

At the present there are no scientific writers on the subject who claim that the Jews are the direct descendants of Shem, the son of Noah, and that during the last 4,000 years have not admitted any non-Jewish blood into their veins through intermarriage or conversions to Judaism. Even the sanguine defenders of the racial purity of the Jews, as Andree, Jacobs, and Judt, agree that, in their early history, the ancient Hebrews have intermarried with the various indigenous tribes of Egypt, Syria, and Palestine, and later during the diaspora with the Romans and Greeks. Biblical tradition and history abound in evidence to this effect. But not all agree on the question whether the Jews have ethnically intermarried with European races during the last 2,000 years of their dispersion. Some of the authors cited above bring forth evidence in support of this theory, while others deny its significance. From the present state of physical anthropology it is to be expected that if these intermarriages have really taken place to any extent, the modern Jews should be possessed of many or most of the morphological traits which characterize their Gentile neighbors. This can be ascertained by a study of the anthropology of the Jews, in the same manner as Professor Boas has studied the American Indian half-breeds, and Mainoff the Yakout half-breeds in Russia.

[1] S. Weissenberg, "Die südrussischen Juden," *Archiv für Anthropol.*, XXIII, 1895.

[2] E. Renan, "Le Judaisme comme race et comme religion," Paris, 1883.

[3] Wm. Z. Ripley, "The Races of Europe," New York, 1899, chapter XIV.

In part such work has already been done. Professor Virchow's investigations of the color of the skin, hair, and eyes of the school children in Germany; Schimmer's work in the same line in Austria, Körösi's in Hungary, Mayr's in Bavaria, and Wateff's in Bulgaria, have comprised nearly 150,000 Jewish children, compared with non-Jewish children in the various provinces in the countries named. Here we find that the percentage of blonds among the Jews is quite large, 32 percent in Germany, 27 in Austria, 23 in Hungary, 22 in Bulgaria, etc. The percentage of light eyes is also large, as can be seen from the appended table (Table I). The type of pigmentation of the Jews being dark, one is at once struck with the large percentage of Jews having light hair and fair eyes combined, and the origin of of these "Indogermanic" Jews (as Virchow speaks of them) is at once questioned.

TABLE I[1]

COLOR OF HAIR AND EYES IN 148,208 JEWISH CHILDREN

Country.	No. of Children.	Hair (Percent).				Eyes (Percent).			Authority.
		Blond.	Brown.	Black.	Red.	Blue.	Brown.	Gray.	
Germany	75,377	32.03	54.39	11.46	0.4	19.30	51.99	27.00	Virchow.
Austria	59,808	27.0	55.40	16.90	0.6	23.50	45.90	30.60	Schimmer.
Bavaria	7,054	30.0	50.00	20.00	—	20.00	49.00	31.00	Mayr.
Hungary	3,141	23.7	57.00	19.30	—	18.30	57.50	24.20	Körösi.
Bulgaria	2,828	22.35	59.59	18.06	2.58	19.38	61.34	22.13	Wateff.

It is a striking fact, however, that a study of the distribution of the blond Jews according to the provinces of these countries

[1] The figures in this table are taken from: R. Virchow, "Gesamtbericht über die Farbe der Haut, der Haare, und der Augen der Schulkinder in Deutschland," *Archiv für Anthropologie*, XVI, 1886; G. A. Schimmer, "Erhebungen über die Farbe der Augen, der Haare und der Haut, bei den Schulkindern Oestreichs," *Mitt. der Anthropol. Gesel.*, Wien, Suppl. I, 1884; G. Mayr, "Die Bayerische Jugend nach der Farbe der Augen, der Haare und der Haut," *Zeitschrift des Konigl. bayerischen statistisch. Bureau*, VII, 1875, pp. 273–311; J. Körösi, Couleur de la peau, des cheveux et des yeus à Budapest," *Ann. de Demographie*, 1878, pp. 136–137; S. Wateff, "Anthropologische Beobachtungen die Farbe der Augen, der Haare und der Haut bei den Schulkindern von den Türken, Pomaken Tataren, Armenier, Griechen und Juden in Bulgarien," *Correspondenz Blatt der aeutschen Ges. für Anthropol., Ethnol. und Urgeschichte*, XXXIV, 1903.

does not indicate the origin of the fair Jews, and does not confirm the opinion that their blondness has been acquired in the countries where we find them at the present day. For it is not found that the percentage of blond Jews is larger in the northern provinces of Germany, where the indigenous population shows the highest proportion of blonds; on the contrary, here they are in the least, but farther east and south, in Galicia, Bukowina, etc., where the indigenous population is darker, the Jews show the highest percentage of blonds. This fact, brought out in Virchow's work, has given rise to considerable discussion. Many (Luschan, Andree, Judt, Elkind) are inclined to believe that these blond Jews are the descendants of the fair-haired individuals among the ancient Hebrews. Andree and Prunner Bey point to the modern non-Jewish Syrians, among whom fair hair and eyes are not infrequent. Luschan says that many blonds inhabited Syria and Palestine in antiquity; they were known in the Bible as the Amorites, "the sons of Anak," who were "men of great stature," and are considered to have been "Aryans." The modern blond Jews are said to be the descendants of the Amorites, with whom the ancient Hebrews intermarried quite freely.[1]

In Galicia, Majer and Kopernicki have studied the comparative anthropology of the races in that country, including the Poles, the Ruthenians, and the Jews. The results they have obtained show great similarities in the somatic characteristics of these three races. Their stature is about the same: Jews, 162.3 cm., Poles, 162.2, and Ruthenians, 164. The cephalic index is: Jews, 83.5, Poles, 84.4, and Ruthenians, 83.3. In the same manner, while the Jews are much darker than the other, still 13.7 percent have fair hair and 29 percent fair eyes.[2] In Russia Talko-Hryncewicz has compared the Jews with the Little Russia Letto-Lithuanians and White Russians. He found that in Little Russia, where the population is characterized by

[1] F. v. Luschan, "Die anthropologische Stellung der Juden," *Correspondenz Blatt der Deutsch. Gesel. für Anthropol.*, XXIII, 1892, pp., 92–102.

[2] J. Majer and J. Kopernicki, "Chrakterystyka fiziczna ludnosci galicijskiej," *Zbior viadom. do anthropologii krajovej, Krakow*, I, 1877, IX, 1885.

tall stature, the Jews are also taller than in Lithuania. That the stature of the Jews depends on the stature of the Gentiles of the country they inhabit has also been shown by Snigirew, who compiled the recruiting statistics of Russia for 1875. In Poland, where the Poles are short of stature (162.7 cm.), the Jews measure only 161.3 cm. (4,470 observations); in Lithuania the general population averages 163.9 cm. and the Jews 161.2 (2,122 observations). In the Baltic provinces, where the Gentiles are much taller, the Jews are also taller, measuring 163.1 cm. on the average; and in Little Russia, where the natives are about 167 cm. in height, the Jews are 164.2 cm.[1] And in Odessa they are even taller, 166.5 cm.[2] In western Europe the same has been observed. In Bavaria the average stature of the Jews is 162.0 cm.,[3] while in Baden, where the general population is taller, the Jews measure 164.3 cm.,[4] and in Turin, Italy, they measure 163.3 cm. on the average.[5]

The head-form of the Jews has confirmed this fact in a more striking manner. It is observed that the cephalic index corresponds to that of the races among which they live. In Caucasia, where many of the natives are hyperbrachycephalic, the Jews are also extremely round-headed, and in eastern Europe, where most of the native races are mesocephalic, the Jews are the same, and in north Africa, where dolichocephaly is prevalent, we find the Jews with the same head-form. This is best shown in the accompanying table (II), from which the following striking fact is to be noted: The Poles in Galicia are brachycephalic, cephalic index 84.4, and the Jews there have an average index of 83.6; in Poland the Poles have an average index of only 80.85, and the Jews of only 81.89.

[1] Snigirew, "Materiali dlia medizinskoi statistiki i geografii Rossii," *Voenno-medizinski zhurnal*, 1878, 1879.

[2] I. I. Pantukhof, "O virozhdayushchikhsia tipakh semitow," *Proc. Russian Anthropol. Soc. at St. Petersburg*, 1889.

[3] J. Ranke, "Zur Statistik und Physiologie der Körpergrösse der bayerischen Militärpflichtigen," etc., *Beiträge zur Anthropologie und urgeschichte Bayerns*, IV, 1881, pp. 8–35.

[4] Otto Ammon, "Zur Anthropologie der Badener," Jena, 1899, p. 646.

[5] C. Lombroso, "L'antisemitismo e le scienze moderne," Torino, 1894, appendix.

TABLE II

CEPHALIC INDEX OF JEWS AND NON-JEWS IN VARIOUS COUNTRIES

Jews.

Country.	Cephalic Index.	Observer.
Caucasus	87.5	Pantukhof.
Galicia	83.6	Majer and Kopernicki.
Baden	83.5	Ammon.
Little Russia	82.9	Talko-Hryncewicz.
Turin, Italy	82.4	Lombroso.
Lithuania	81.7	Talko-Hryncewicz.
Russian Poland	81.89	Elkind.
White Russia	80.9	Yakowenko.

Non-Jews.

Race.	Cephalic Index.	Observer.
Aïssors in Caucasia	87.89	Arutinoff, Pantukhof.
Armenians in Caucasia	87.0	Ivanowski.
Poles in Galicia	84.4	Majer and Kopernicki.
Ruthenians in Galicia	84.3	Majer and Kopernicki.
Germans in Baden	84.14	Ammon.
Russians, Little	83.2	Talko-Hryncewicz.
Italians in Turin	84.9	Lombroso.
Letto-Lithuanians	80.60	Talko-Hryncewicz.
White Russians	83.2	Talko-Hryncewicz.
Poles in Russia	80.85	Elkind.
White Russians	81.87	Ivanowski.

In Baden the cephalic index of the Germans is 84.14 and of the Jews 83.5, and it is remarkable, says Ammon, that in the parts of the country where the heads of the indigenous population are broader, those of the Jews are about the same, and the reverse. There are very scanty data about the cranial form of the Jews living among extremely dolichocephalic races, particularly Semites, as the Arabians, Syrians, Berbers, etc., but all the evidence available goes to prove that here they are also dolichocephalic. Thus, Pruner Bey brings measurements of three Jewish skulls from north Africa, with a cranial index of 75, and two Jewesses with an index of 77.[1] Quatrefages and Hamy have measurements of a Jew from Algiers with a cephalic index of 74.44, and five from Holland, 72.2,[2] and Dessau five

[1] *Memoirs de la Société d'Anthropologie de Paris*, Tome II, fasc. 4, 1864, p. 417.

[2] "Crania Ethnica," Paris, 1882, p. 513.

other skulls from Holland (in Musee Vrolic) with an average index of 77.48. Davis described the skulls of three Italian and two Dutch Jews with an index of 76.33.[1] All these skulls confirm that the Jews who live among dolichocephalic races are also dolichocephalic. The crania from Italian and Dutch Jews mentioned by Dessau, Davis, and Quatrefages are of Spanish Jewish origin, and their dolichocephaly corresponds to the type of head of the indigenous population of Spain.

It is a fact worthy of mention that the Jews expelled from Spain in 1492, known as "*Sephardim*," or *Spagnuoli*, have not everywhere preserved their type as is generally supposed. Thus measurements taken by Jacobs on 50 Sephardim in London show that the proportion of dolichocephalic heads (cephalic index less than 78) among them was 17 percent, as against 28.3 percent among the *Ashkenazim*.[2] In Turin also the cephalic index of the Jews is 82.14, and only 22.32 percent had indices less than 80.[3] This is confirmed by Livi who found the average index in Italian Jews to be 81.6.[4] In Bosnia Glück obtained measurements of 55 Spagnuoli, whose cephalic index was 80.1, and only 7.3 percent were dolichocephalic.[5] From all these measurements it is evident that the modern Sephardim are not long-headed as was supposed. It is doubtful whether this is due to intermarriage with Ashkenazim, because the former have kept themselves separated from the latter. The frequency of blond and red hair among these Jews is also almost as large as among the German Jews. Beddoe found three percent of blonds among the Sephardim in Constantinople and Bruza, and six percent in London.[6] In Turin Lombroso found 5.8 percent, and Livi even 14.7 percent as against only 9.3 percent among the general population of Italy, and in Bosnia even 18.2 percent

[1] J. B. Davis, "Thesaurus craniorum," London, 1867.

[2] Joseph Jacobs, "On the comparative anthropometry of English Jews," *Journ. Anthropol. Institute*, XV, pp. 76–88.

[3] Lombroso, *loc. cit.*

[4] R. Livi, "Antropometria militare," Roma, 1896, pp. 188–190.

[5] L. Glück, "Beiträge zur physischen Anthropologie der Spaniolen," *Wissenschaftliche Mitteilungen aus Bosnien und der Hercegovina*, IV, 1896, pp. 587–592

[6] J. Beddoe, "On the physical characters of the Jews," *Transactions Ethnol. Soc. London*, I, 1861, pp. 222–237.

of fair hair and 30.9 percent of fair eyes,[1] while Jacobs found 21.3 percent of the Sephardim in London had blue eyes, which is more than among the Ashkenazim in that city who had only 11.1 percent of fair eyed.

All these data tend to show that there is a great diversity of types of Jews when their stature and craniology are considered; but when looked at from the standpoint of pigmentation, they present a more or less uniform type — wherever data are obtainable it is found that about ten to fifteen percent have fair hair, and over thirty percent fair eyes. In other words, morphological characters, which are obtained by the use of the tape and calipers, and which are not influenced to an appreciable extent by the personal equation of the observer, depend in the Jews on the same characters peculiar to their non-Jewish neighbors, among whom they have lived for centuries. On the other hand, pigmentation, a trait the study of which is subject to the personal equation of the observer (what one living among brunettes will call blond, may be called by another observer, living among blonds, a brunette) is found uniformly frequent among the Jews in various countries, independent of the frequency in which it is found among the Gentiles among whom they have lived.

It appeared to the present writer that an anthropological study of the Jews in various countries by one observer, thus greatly eliminating the effects of the personal equation, may contribute to the solution of some of the obscure problems of the origin of certain physical traits of the Jews. It would be quite difficult for one individual to make such an investigation in Europe. Besides the extensive traveling it would entail, it would also be a difficult task to meet with Jews willing to submit to anthropometrical measurements. One has to read Dybowsky's experiences in Minsk, Russia, to be convinced that in eastern Europe the task would prove quite difficult. After paying an agent for procuring individuals willing to submit to measurements for a consideration, it so happened that one of the Jews measured died suddenly. This caused alarm all over the city, the local police

[1] Glück, *loc. cit.*

interfered, and the measurements had to be discontinued. Most of the other anthropological researches of Jews in eastern Europe were obtained by physicians, in the regular course of their practice among these people, or in hospitals. Very little success can be expected from trying to induce these people to submit to measurements for scientific purposes.

New York City is the best place in the world to obtain anthropometrical measurements of Jews. Of the 600,000 Jews or more living here, more than three quarters have arrived in the United States within the last thirty years from the various European countries, also from Asia and even Africa. The vast majority are natives, or the descendants of Jews from Russia, Poland, Austria, Hungary, Roumania, and other parts of eastern Europe; some have come from Syria, Palestine, and even from Algiers, Tunis, and Morocco. The material for investigation is consequently the most heterogeneous, and can not be found to such an extent in any other city or even country. By using ordinary tact I succeeded in obtaining measurements of over 2,000 individuals of both sexes, and all over twenty years of age. Over one half of these were applicants for relief in the United Hebrew Charities in this city. They offered no serious objections to the procedure, believing that the measurements were a means of discovering the nature of their ailment, or their physical ability to work. Only the native Jews objected seriously, suspecting that these measurements are the "Bertillon system," and, denying guilt of any crime, they usually refused to submit. It is to be regretted that mainly for this reason I succeeded in obtaining measurements of only 124 Jews born in the United States.

The following data were obtained for each individual: (1) Age; (2) sex; (3) nativity, country and province; (4) how long in the United States, if foreign born; (5) occupation; (6) color of — (*a*) the hair, (*b*) the eyes, (*c*) beard, (*d*) variety of the hair; (7) stature; (8) girth of the chest, during quiet respiration; (9) longest diameter of the head; width of the head; (10) cephalic index; (11) circumference of the head; (12) height of the nose; (13) width of the nose; (14) nasal index; (15) height of the face; (16) width of the face; (17) facial index.

Each of these data was recorded on a specially prepared card for each individual, which made it afterward easy to classify and to compute the figures in various groups.

Method of Investigation of the American Jews

The main aim of this investigation has been to gather materials for a comparison of the somatic characters of the Jews within the races and peoples among which they have lived before emigrating to the United States. The nativity of the Jews under consideration has therefore been considered not by geographical or political boundaries, but as far as was possible to ascertain, by ethnic conditions of their native countries. When one stated that his nativity was Russia, he was also asked in which province (government) of the empire he was born. As is well known, 93.9 percent of the 5,189,400[1] Jews in Russia live in what is known as the "Pale of Settlement." This comprises 25 provinces in western and southern Russia, and Poland. The indigenous population of this region consists mainly as follows: In Poland the Poles; in western Russia we have the White Russians in the provinces of Minsk, Mohileff, and Witebsk; and the Letts and Lithuanians in the provinces of Wilna, Kovno and Grodno; the Little Russians in Vohlin, Kieff, Podolia, Poltava, Tchernigoff, Bessarabia, Cherson, etc. It must however be remembered that while the predominating ethnic elements in these provinces are as indicated, still in many parts ethnic conditions are not so simple. Some parts of Russian Poland have a large population of White Russians and Lithuanians, and the reverse; in the south and southwest the majority of the natives are Little Russians, but in Bessarabia, parts of Podolia, etc., a fair number of Wallachians, Roumanians, etc., are encountered, and farther south, many Tartars. To obviate as far as possible all these disturbing factors, and to make the best of the situation, it was considered best to divide the Russian Jews into three groups: (1) *Polish Jews*, from the ten Polish provinces; (2) *Lithuanian and White-Russian Jews*, from Kovno,

[1] Census of Russia, 1897.

Vilna, Grodno, Mohileff, Minsk, Witebsk, etc.; (3) *Little-Russian Jews*, from Vohlin, Kief, Podolia, Poltava, Tchernigoff, Bessarabia, Cherson, etc.

These were compared with the races among which they have lived in all cases where material for comparison was available in anthropological literature. The immigrant Jews from Galicia were compared with the Poles and Ruthenians in that country, and the Roumanian and Hungarian Jews, with the native Roumanians and Magyars in these countries. By dividing the material into groups according to nativity, it was found that the number of observations in each group is rather small to give reliable results. The figures obtained by measurement of the immigrant Jews in New York were then combined with figures obtained by measurement of Jews in eastern Europe. In this manner it was possible to present a larger number of observations, making the results and conclusions more reliable. Thus our own observations of Galician Jews include 305 men, but combined with 836 men reported by Majer and Kopernicki, we have 1,141 observations; the measurements on Polish Jews, of whom 315 were measured in New York, were combined with 200 cases measured by Elkind in Warsaw, giving a total of 515 observations, etc. These combined figures were considered in connection with figures obtained by measurement of non-Jews in eastern Europe, taken from the anthropological literature on these races. It was often deemed advisable to bring detailed statistics, because most of the literature referred to is published in the Russian or Polish languages, which makes it inaccessible to the average American reader. For Galicia, Majer and Kopernicki's and Weisbach's works on the Poles and Ruthenians were used; for the Russian Poles, Elkind's work was taken as standard, and besides, Olechnovicz, Talko-Hryncewicz, and Zakrzewski were often consulted. For the Little Russians, Talko-Hryncewicz's work was principally used, and also Diebold, and Belodied; for the Lithuanians and White Russians, Talko-Hryncewicz's and Eichholtz's researches; for the Roumanians, Pittard's; for the Hungarians, Weisbach's and Janko's works. Besides these, Ivanowski's recent compilation

on the anthropology of the races in Russia was freely drawn upon.

It was considered of importance to discuss some special problems in connection with the study of the physical anthropology of the immigrant Jews in the United States. First, the question of selection by immigration was investigated. This was done by comparing the results obtained by a study of the immigrant Jews with those who were measured in their native land. Literature on the Jews in eastern Europe was available only for Poland, Galicia, Little Russia, Lithuania, and White Russia; it could not be obtained for the Hungarian and Roumanian Jews—the measurements here reported, as far as our knowledge goes, are the first published. In this connection particular attention was paid to the differences in respect to stature, head-form, pigmentation, between the immigrants and the stay-at-homes. Next to this, the effects of occupation and social conditions on stature were considered, for reasons which are fully set forth in the text.

The author believes that he presents here, besides his own investigations on the anthropology of the Jews, most of the available data published in European literature on the anthropology of the Jews and the races and peoples among whom they have lived for centuries. Analyzing the similarities and differences of the physical types of the Jews as compared with those of the Gentiles in the same country, it is to be expected that many points are brought out which may contribute to the solution of some of the more important problems presented by this most peculiar of races.

CHAPTER II

Stature

The average stature of the 1,528 Jews examined by the present writer in New York City is 164.5 cm. (5 feet 4¾ inches). The maximum height is 187.5 and the minimum 135 cm. The tallest individual was thus 23 cm. or 13.97 percent larger than the average; while the shortest individual was 29 cm., or 17.97 percent of the average stature. The variation is thus seen to be more active in the production of shortness of stature. As a whole, the range of extreme individual variation extended over 52 cm., or 31.61 percent of the average height, which is not large when compared with that observed in other European races, but quite large when considered in connection with observations on Jews in various European countries. Thus, from Blechman's work on the anthropology of the Jews in Russia, we find that the range of individual variation was only 17.4 percent of the average stature; Yakowenko found it to be, among the White-Russian Jews, 18.7 percent; Weissenberg in South Russia, 21.5 percent; Talko-Hryncewicz in Little Russia, 23.4 percent. The only group of Jews in whom the extreme individual variation of stature exceeds that observed among the Jews in New York are the Galicians, reported by Majer and Kopernicki; they show a range of 34.5 percent of the average stature. Among other peoples the range of variation has been much larger; in Gould's extensive American statistics we find it to extend over 108 cm. But we deal here with a conglomeration of races. Pagliani, in Italy, has found a difference of 74 cm. between the maximum and minimum stature, and the same value has been found among conscripts in Baden, observed by Ammon, while the Jews in the same locality have shown a range of variation of stature of only 30 cm. — less than one half. Another fact worthy of note is that not one individual of 190 cm. in height or more was encountered among these 1,528 Jews

in New York, and a survey of the literature of the anthropology of the Jews does not reveal one recorded. According to Gould's statistics, nearly 5 individuals in 1,000 are taller than 190 cm., and in England, according to the report of the Anthropometric Committee, 3 in 1,000. This again accentuates the shortness of stature of the Jews when compared with a tall people like the Americans or the English. The Italians, who are of about the same stature, or even lower than the Jews, show the same characteristic. Pagliani found only one individual in 7,000 examined to be 190 cm. or more in height. That the shortest individual among the Jews observed in New York was 135 cm. is also peculiar — it is best explained by recalling that dwarfed persons are less likely to emigrate to a distant land, and perhaps also because the immigration authorities may not permit their landing.

Biologists have recently been making use of another method of estimating the variability of physical characteristics which gives better results than the mere average, with the calculation of the extreme variation of the maximum and minimum. It is known as the "error of mean square" or the "index of variability." This is determined as follows: At first the deviations $[x]$ from the average, both positive and negative, are determined. Each of these is then squared $[x^2]$ and then added, and the sum is divided by the number of observations $[n]$, and finally the square root of the quotient is extracted, thus:

$$\sigma = \sqrt{\frac{\Sigma(x^2 \cdot f)}{n}}.$$

The resulting σ is termed by Pearson the "standard deviation." It is a concrete number, being expressed in the same units as the measurement of the individuals measured. In the case of human stature it is expressed in centimeters.

To make use of this method of estimating the variability of stature of the Jews, the magnitudes obtained by measurement were arranged in a series of classes, each class representing the number of persons who have attained a certain height, at inter-

vals of one centimeter. Thus twelve persons were observed in the class between 152 and 152.9 cm. in height; 62 in the class between 169 and 169.9 cm., etc. The average stature being 164.5 cm., it is seen that in the first case $x = -12.5$ cm.; $x^2 = 156.25$, and $x^2 \cdot f = 1{,}875$. In the second class $x = +4.5$, $x^2 = 20.25$, and $x^2 \cdot f = 1{,}255.5$. This was done for each deviation (grouped by centimeters), beginning with the smallest and ending with the largest value. The products of $x^2 \cdot f$ were then added together and the sum of these divided by $n =$ the number of individuals measured $= 1{,}528$, and the square root extracted from the quotient. By this process it was found that the standard deviation of 1,528 Jews was for their stature ± 6.58. Within the limits of ± 6.58 it was theoretically expected that about 68 percent of the number of variates would lie. Empirically this was confirmed. We found that within the limits of the standard deviation, *i. e.*, $164.5 + 6.58$ $(= 171.08)$ and $164.5 - 6.58$ $(= 157.92)$, were 1,027 individuals, $= 67.21$ percent.

As is well known, the determination of the mean or average is never perfect; it is always only an approximation to the true average. This is due to inevitable errors of observation and calculation. These errors may be diminished by careful attention to details while taking measurements, and calculating the results, or by taking measurements on a very large number of people, but they can never be entirely eliminated. The finding of the "*probable error*" is a good method of determining the accuracy of the average value. This is determined by multiplying the standard deviation by the constant 0.6745 and dividing the product by the square root of the number of individuals measured, thus:

$$\pm 0.6745 \times \frac{\text{Standard deviation}}{\sqrt{\text{number of observations}}} = \pm 0.6745 \frac{\sigma}{\sqrt{n}}.$$

The probable error gives the closeness of the approximation to truth. In the case of the Jews under consideration we have calculated that the probable error is 0.1133 cm. With the aid of this figure we can say that there is an even chance that the

true average lies within the limits of ± 0.1133; that the chances are four to one that the true average lies within twice these limits, and nineteen to one that it lies within thrice these limits. From the nature of the method used in obtaining the probable error, it will be observed that the probable error is less, *i. e.*, the average is more accurate the greater the number of observa-

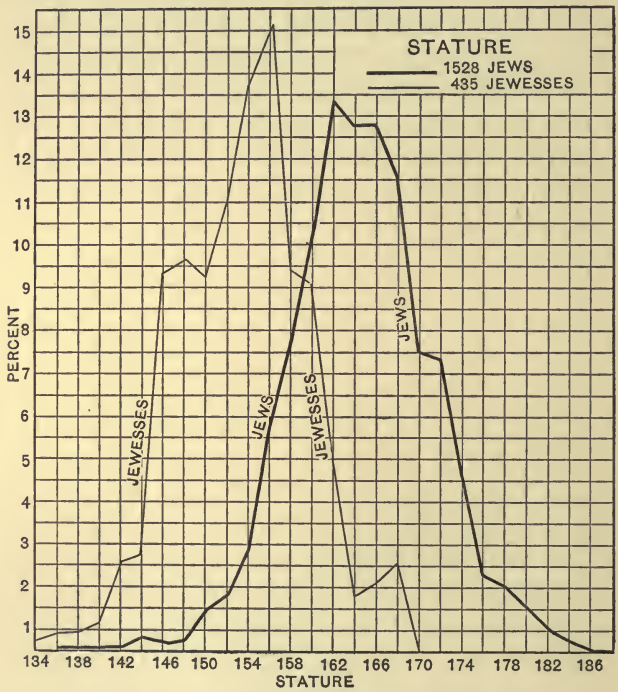

FIG. 1.—Stature of 1,528 Jews and 435 Jewesses.

tions. This accuracy does not increase, however, in the same proportion as the number of persons measured, but as the square root of this number. As the standard deviation decreases, the probable error of the mean decreases.

As our study of the Jews is concerned mainly with their racial characteristics, if any such can be discerned, we can not rely on the average alone to determine the type. This is only a convenient, but very vague, means to express a complex group of

figures by a single number or a few numbers. In order to appreciate and bring out prominently the various elements that compose a population we use methods besides the average. The best method, and the one now most widely employed by anthropologists, is that of coördination and seriation, by arranging the figures obtained from measurement of the individuals in an ascending or descending order of figures, each expressing a certain stature. Thus we may elicit one or more figures around which most of the individuals are grouped; various racial elements may in this manner be discerned in a group of people who apparently are of a single and more or less pure race.

TABLE III

STATURE OF 1,528 JEWS

Stature (in cm.).	Number.	Percent.	Stature (in cm.).	Number.	Percent.
135–136	1	0.07	163–164	189	12.37
137–138	1	0.07	165–166	189	12.37
139–140	1	0.07	167–168	169	11.06
141–142	2	0.13	169–170	107	7.00
143–144	4	0.26	171–172	96	6.28
145–146	3	0.20	173–174	67	4.38
147–148	4	0.26	175–176	28	1.83
149–150	15	0.98	177–178	23	1.50
151–152	20	1.31	179–180	16	1.05
153–154	37	2.42	181–182	9	0.60
155–156	82	5.36	183–184	6	0.40
157–158	110	7.29	185–186	1	0.07
159–160	150	9.82	187–188	1	0.07
161–162	197	12.89	Total.	1,528	100.02

In Table III this has been done with the figures obtained by measuring Jews in New York. It will be seen from the figures in this table that up to the height of 148 cm. there are very few individuals; only one percent were observed to be of such low stature. The number of persons at a given height now begins to increase slowly until the height of 162–163 is reached. In this group we find the largest number of people — 197, or 12.89 percent. The proportion of observations now remains about stationary till 166 cm. is reached, when the percentage begins to decrease steadily until the height of 180 cm., where the number of persons again becomes insignificant. The

arrangement of the various heights attained by the Jews will best be appreciated by observing the curve plotted from these figures. It will be observed in figure 1 that the curve on the left side rises steadily until it reaches the point of 162 cm. in height; it does not descend in the same manner, but remains stationary up to 166 cm. It rises again at 171–172, and 174–180, which indicates that there is an excess of tall men among the Jews in New York. This is best explained by the fact that they are an immigrant population, and emigrants are always

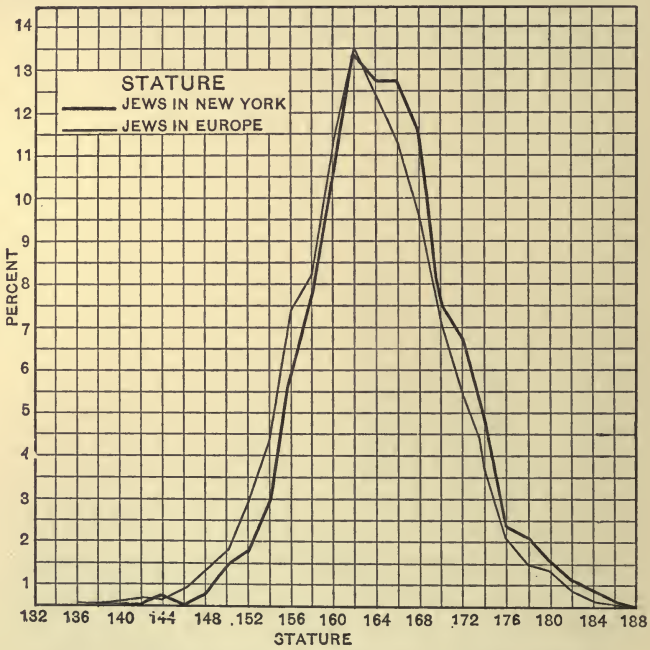

FIG. 2.— Stature of Jews in New York and in eastern Europe.

taller on the average than the people in their native home. This has been already shown, from Gould's statistics, to be a fact with other immigrants. The reason assigned is that most of the dwarfed, sickly, and infirm remain at home and do not venture on so long a journey. It is mostly the strong, the healthy, and the well developed who emigrate. That this is also the

case with the Jews in the United States is seen from the fact that the average stature in New York City is 164.5 cm., which is much above that observed in eastern Europe. There, Snigirew and Elkind have found that the average height of the Jews in Poland is 161 cm.; in Galicia it has been observed to be 162.3 (Majer and Kopernicki); in Hungary 163.3 (Scheiber), etc. Only in southern Russia has it been observed that the Jews are as tall as we find them in New York City — 164.5 cm. according to Snigirew and Weissenberg. And the Jews coming here from these regions are found to be much taller than those from other countries, as will be seen later.

To test this point more definitely, we have collected from the literature on the anthropology of the Jews measurements of 1,681 Jews in eastern Europe for comparison with those in New York. These were taken from Majer and Kopernicki, 836 Galician Jews; Talko-Hryncewicz, 506 Russian Jews; Elkind, 200 Polish Jews; and Yakowenko, 139 Russian Jews. It will be seen that these represent nearly all the countries from which the Jews come to the United States, excepting Roumania and Hungary. For the former there is no literature available, and Scheiber's statistics for the latter are not reported in a manner suitable for comparison. Grouping the figures into four divisions, as proposed by Topinard, and considering those who attain less than 160 cm. in height as of "short stature," 160 to 164.9 cm. as "stature below the average," 165 to 169.9 cm. as "stature above the average," and 170 cm. and over as "tall stature," we find the following proportions:

TABLE IV

STATURE OF JEWS IN THE UNITED STATES AND IN EASTERN EUROPE

	Elkind.	Yakowenko.	Talko-Hryncewicz.	Majer & Kopernicki.	Jews, Europe.		Jews, New York.	
					No.	Percent.	No.	Percent.
Short	91	53	152	300	596	35.46	356	23.30
Below the average	57	46	152	291	546	32.48	460	30.10
Above the average	40	27	128	165	360	21.41	420	27.49
Tall	12	13	74	80	179	10.65	292	19.11
Total	200	139	506	836	1,681	100.00	1,528	100.00

From this table (IV) it is seen that individuals of short stature were found in Europe to reach 35.46 percent, while among the immigrant Jewish population in New York City it was only 23.3 percent. Large stature, on the other hand, is among the Jews in eastern Europe 10.65 percent, and in New York the proportion is nearly double, 19.11 percent. Median height, that is, 160 to 170 cm., is about equally distributed between the two groups. The superiority in stature of the immigrant Jews in the United States as compared with those in eastern Europe is shown to better advantage in the accompanying diagram (fig. 2), con-

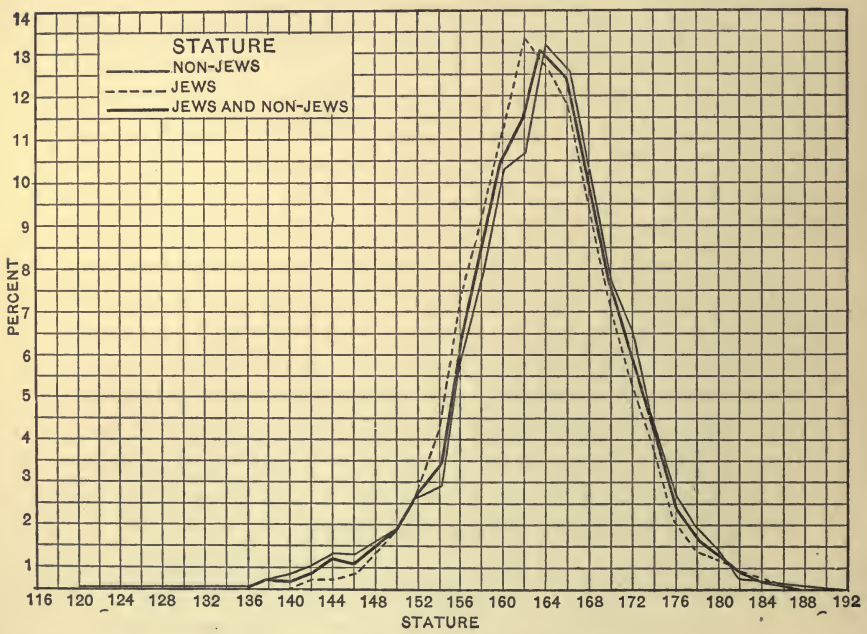

FIG. 3.— Stature of Jews and non-Jews.

structed from the tables given in the works of the above mentioned authors. The curve for the Jews in the United States is situated more toward the right, while the one for those in Europe is more to the left, although their course in other respects is almost identical.

Table V

Stature of Jews and Non-Jews in Eastern Europe

mm.	Jews.		Non-Jews.		Jews and Non-Jews.	
	Number.	Percent.	Number.	Percent.	Number.	Percent.
115–116	—	—	1	0.01	1	0.01
117–118	—	—	—	—	—	—
119–120	—	—	2	0.03	2	0.02
121–122	—	—	2	0.03	2	0.02
123–124	—	—	1	0.01	1	0.01
125–126	—	—	2	0.03	2	0.02
127–128	—	—	1	0.01	1	0.01
129–130	—	—	8	0.12	8	0.08
131–132	2	0.07	12	0.18	14	0.14
133–134	—	—	7	0.10	7	0.07
135–136	1	0.03	8	0.12	9	0.09
137–138	2	0.07	17	0.26	19	0.19
139–140	1	0.03	22	0.32	23	0.23
141–142	10	0.31	37	0.55	47	0.48
143–144	10	0.31	51	0.76	61	0.62
145–146	13	0.40	47	0.70	60	0.61
147–148	27	0.84	74	1.10	101	1.02
149–150	44	1.37	100	1.49	144	1.45
151–152	79	2.46	151	2.25	230	2.32
153–154	119	3.70	164	2.45	283	2.86
155–156	224	6.98	361	5.38	585	5.90
157–158	277	8.63	500	7.45	777	7.83
159–160	341	10.62	652	9.72	993	10.01
161–162	414	12.90	680	10.45	1,094	11.03
163–164	394	12.28	848	12.64	1,242	12.52
165–166	365	11.37	813	12.12	1,178	11.87
167–168	289	9.00	652	9.73	941	9.45
169–170	210	6.54	491	7.32	701	7.07
171–172	155	4.83	408	6.08	563	5.69
173–174	108	3 37	252	3.76	360	3.64
175–176	48	1.52	147	2.19	195	1.97
177–178	30	0.93	97	1.45	127	1.28
179–180	23	0.72	55	0.82	78	0.79
181–182	13	0.40	22	0.33	35	0.35
183–184	7	0.22	15	0.22	22	0.22
185–186	1	0.03	7	0.10	8	0.08
187–188	2	0.07	—	—	2	0.02
189–190	—	—	1	0.01	1	0.01
	3,209	100.00	6,708	99.97	9,917	100.02

In figure 3 is shown a curve constructed from the figures representing both the Jews in eastern Europe and in New York City, a total of 3,209 persons. It will be observed that the apex points at 162 cm. which is about the average for the Jews in Europe. Toward the left, where stature below the average

is represented, the curve runs progressively downward until the stature of 150 cm. is reached, when the number becomes almost insignificant. But to the right, where heights above the average are shown, a significant point is to be seen. Up to 168 cm. there is shown an elevation of the curve which is not seen in the curve for the Jews of eastern Europe, but exactly corresponding to the elevation in the curve representing the Jews in New York City. This again shows plainly the process of selection which is usual for immigrants as regards their physical condition — the taller ones are more adventurous and are more apt to leave their native land to seek fortunes in other countries.

The first impression one gets while examining this curve is that the Jews do not show any evidence of intermixture with other races. It has been accepted by many anthropologists that the seriation and coördination of any physical character of a people in whom there has taken place an appreciable amount of racial intermixture will not show a smooth curve. It will display more than one apex, corresponding to the racial elements that have entered into the composition of the people. On the other hand, when a curve shows a single apex — one maximum of frequency, around which are clustered all the other observations, the lesser values to the left and the larger to the right,—it may be accepted as good proof of the purity of the race. Viewed from this standpoint, the Jews can be considered as pure, showing no evidence of foreign blood in their veins.

The fallacy of such a contention will be evident if we first consider the stature of the races and peoples among whom the eastern European Jews have lived for centuries. They are primarily those whom ethnologists designate under the vague term "Slav" races. Of these we find in Poland the Poles, whose stature is quite short, 162 to 164 cm. in height (Majer and Kopernicki, Olechnowicz, Elkind, Snigiref, Zakrzewski, etc.). In Lithuania and White Russia the Lithuanians, Letts, and the White Russians are somewhat taller — 163 to 165 cm. The Little Russians in southern Russia and the Ruthenians in Galicia are taller, to be sure, but their height does not exceed 166.7 cm. and in some localities it is much lower —

only 162 to 163 cm.[1] In Hungary ethnic conditions are not so simple. Here we have the Magyars who are among the shortest of Europeans, less than 162 cm. in height. Being ethnically allied to the Ruthenians of Galicia and the Little Russians of the Ukraine, the Slavs in that country are taller, as is to be expected — they reach 164.6 cm. The Germans in Hungary are of about the same height (Scheiber). The Roumanians are about midway between the short Poles and Magyars, the tall Little Russians and Ruthenes. From the recent investigations of Pittard they are found to be 165 cm. in height. A glance at the map prepared by Anutchin and reproduced by Ripley[2] showing the distribution of stature in this region of Europe, will make this point clear.

This is the stature of the races among whom the Jews under consideration have lived for the last eight or ten centuries. If any infusion of foreign blood has taken place, these races must have been the sources from which it came. This we must remember at the outset before considering the curve showing the distribution of stature of the Jews and Christians in eastern Europe.

In order that we may see the probable effect of such an intermixture of the Jews with the races among whom they have lived for a longer time, the following plan of investigation has been adopted: We have collected from the anthropological literature on the eastern European races measurements of 6,708 individuals, including:

1,055 Little Russians, from Talko-Hryncewicz's work.
476 Letto-Lithuanians, " " " "
961 White Russians, " " " "
2,861 Poles from Galicia, " Kopernicki's "
1,355 Ruthenians from Galicia, " "

These have been tabulated in Table V and the percentages of frequency calculated for each group of stature; the results have been plotted in the diagram as a curve, a glance at which reveals the following salient points: Notwithstanding the fact

[1] Talko-Hryncewicz, Kopernicki, Anutchin, Ivanowski, and others.

[2] "Races of Europe," p. 348, and also the map for Austria-Hungary, p. 350.

that it is composed of a group of peoples each of which has no special claim to exceptional racial purity; notwithstanding that, no matter how pure each of these races may claim to be, still a mixture of all of them can not be considered as representing a pure type, — the resulting curve of stature is as smooth as could be expected of the purest of races.[1] One more point is to be considered of significance: The course of this curve is almost identical with that for the Jews, seen on diagram 3, with one exception, — it is situated about two centimeters to the right, thus showing that the Christians of eastern Europe are on the average about two centimeters taller than the Jews. The apex points at 164 cm., while the one for the Jews points at 162 cm. Considering the conditions of poverty and privation under which the Jews in eastern Europe are laboring, the indoor occupations in which they are generally employed, and the absence of agricultural laborers among them, we are not surprised at the shortage of about an inch of stature that they display, when compared with their non-Jewish neighbors, who are generally under better economic and social conditions, working mostly outdoors. The similarity of stature of the Jews to that of non-Jews of eastern Europe of which we have already spoken will be still further apparent when we consider them not *en masse* but in groups according to the country they inhabit. This we will do later.

As a further test we have combined the 3,209 Jews with the 6,708 Gentiles and with both sets of figures have constructed the curve shown in figure 3. This curve again shows no double apex, no significant elevations or indentations in its course, thus again proving that the smooth course of the curve representing the stature of the Jews can not be considered a proof of their racial purity. It is evident that no amount of foreign blood coming from the races of eastern Europe, among whom the Jews have lived, would have shown itself in a study of the seriation of their stature.

The reason for this condition is evident: The difference in the type of stature of the Jews and Gentiles in eastern Europe is

[1] The slight indentation at the height of 162 cm. can be ascribed to chance.

very slight, almost insignificant,— 162 to 163 cm. for the former, and 164 to 165 for the latter, is about the standard of height for these peoples. Intermixture with people who differ but one to two centimeters in height cannot have any effect on the distribution of stature so as to be evident in a seriation, as can be readily seen in diagram 3. If the difference in stature had been larger, say eight to ten centimeters, supposing the intermixture had taken place with the Scotch, who average over 170 cm. in height, the curve might have shown it by a double apex.

What we desire to emphasize, however, at this point, is that the smooth course of the curve for stature of the eastern European Jews does not exclude the possibility of racial intermixture.

Table VI

Stature of 1,528 Jews According to their Nativity

Stature (in cm.).	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.	United States.
137–138	0.33	—	—	—	—	—	—
139–140	—	0.31	—	—	—	—	—
141–142	0.33	—	0.36	—	—	—	—
143–144	1.31	—	—	—	—	—	—
145–146	0.98	—	—	—	—	—	—
147–148	0.65	—	—	—	1.33	—	—
149–150	2.95	0.95	—	0.91	—	—	0.80
151–152	3.28	1.59	0.36	0.45	1.33	0.72	—
153–154	3.61	4.13	1.82	0.91	1.33	1.43	1.61
155–156	7.21	7.30	6.18	3.19	4.00	3.57	1.61
157–158	8.53	9.21	6.91	5.02	8.00	7.14	2.42
159–160	12.13	9.84	12.00	7.77	6.67	10.71	5.65
161–162	11.15	15.24	14.55	13.70	10.00	13.57	8.87
163–164	12.46	11.11	13.46	15.53	12.67	7.86	12.10
165–166	10.16	13.97	11.63	13.70	9.33	15.71	12.90
167–168	7.87	10.16	12.72	12.79	10.67	10.72	15.32
169–170	5.90	6.03	5.82	7.31	8.67	8.57	10.49
171–172	6.23	3.49	5.82	8.22	8.67	7.14	7.26
173–174	2.63	1.90	4.36	5.48	8.00	5.00	8.07
175–176	0.98	1.90	1.46	1.37	2.67	2.86	3.23
177–178	0.33	1.59	0.73	1.37	3.33	2.14	3.23
179–180	0.33	0.63	0.36	0.91	1.33	2.14	4.03
181–182	—	0.31	0.73	1.37	0.67	0.72	0.80
183–184	0.65	0.31	0.36	—	1.33	—	—
185–186	—	—	—	—	—	—	0.80
187–188	—	—	—	—	—	—	0.80
No. measured.	305	315	275	219	150	140	124
Average stature.	162.2	163.4	164.2	165.7	166.0	165.7	167.9

In Table VI is shown the individual variations of the stature of the Jews in New York City, according to their nativity. It will be observed that there are noteworthy differences in the stature of each group of Jews. A comparsion of these figures with measurements obtained in eastern Europe shows that the immigrants are taller than the Jews in their native countries. Thus, the average stature of the Jews in Poland was found by Snigireff and Elkind to be 161 cm., while those who left Poland and emigrated to the United States are found to be 163.4 cm. in height. In Lithuania and White Russia Snigireff, Talko-Hryncewicz, and Yakowenko found the average height of the Jews about 162 cm., and immigrants from this region of Russia are seen to be 164.2 cm. on the average. In southern Russia Snigireff's and Weissenberg's measurements show that the Jews are over 164 cm. and the immigrants from this country are found to average 165.7 cm. in height. The same is true of the Jews from Hungary, who in their native land were found to be 163.3 cm. (Scheiber), while those in New York are 2.4 cm. taller, averaging 165.7 cm. The only exception are the Jews from Galicia, who were found by Majer and Kopernicki to be 162.3 cm. in their native land, while in New York they are of the same height. As will be seen later this exceptional phenomenon is not confined to stature; "selection by immigration" is also negative among these Jews as regards their headform. But in all the other groups it appears that the immigrants are taller than those left at home.

This phenomenon appears in a more striking manner when we compare the immigrants with their coreligionists at home by grouping the figures obtained by measurement in four groups of stature—short, below the average, above the average, and tall. For comparison, the literature of the anthropology of the Jews in eastern Europe has been utilized, and the figures are presented in Table VII.

From this table it is seen that the proportion of short persons is larger among the Jews in their native lands than among those who emigrated to the United States. Twenty-nine percent of the Jews in Little Russia are below 160 cm. in height, and

only 14 percent of the Jewish immigrants from that country are in this class of stature; in Lithuania the proportions are 38 to 21 percent. The only exception is again with the Galician Jews, where the proportion of persons less than 160 cm. in height was found by Majer and Kopernicki to be 29 percent, and in New York City such short persons are more frequent, reaching 36 percent. Tall individuals, 170 cm. in height and taller, are more frequently met with among the immigrants than among those measured in their native land, again with the exception of the Galicians. Among the Little-Russian Jews this class of stature is 21.95 percent in New York and only 14.61 percent at home; among the White-Russian and Lithuanian Jews 14.91 in New York and 9.39 percent at home; and among the Polish Jews 13 percent in New York and 6 percent in Poland. The same is the case with the Hungarian Jews when we compare our statistics with those obtained by Scheiber in Hungary.[2]

TABLE VII[1]

STATURE OF IMMIGRANT JEWS IN NEW YORK COMPARED WITH THOSE IN EASTERN EUROPE

Stature (in cm.)	Galicia.		Poland.		Lithuania and White Russia.		Little Russia.	
	N. Y.	Galicia.	N. Y.	Poland.	N. Y.	Lithuania.	N. Y.	Lit. Russia.
— 160	36.07	29.16	29.20	45.50	21.45	38.10	14.60	29.22
160–165	28.85	29.17	30.48	28.50	34.55	33.09	32.87	29.00
165–170	21.64	25.00	27.30	20.00	29.09	19.42	30.58	27.17
170 +	13.44	16.67	13.02	6.00	14.91	9.39	21.95	14.61
— 165	64.92	58.33	59.68	74.00	56.00	71.19	47.47	58.22
165 +	35.08	41.67	40.32	26.00	44.00	28.81	52.53	41.78

[1] The figures for the Jews in eastern Europe in this table are taken from: Galicia, Majer and Kopernicki, "Charakterystyka fizyczna ludnosci galicyzskiej," *Zbior wiadom. do antropol. krajowej*, Krakow, 1877, 1885, Vols. I and X. Poland, A. D. Elkind, "The Jews," Publications of the Society of Friends of Natural Science, Anthropology and Ethnography, Vol. XXI, Moscow, 1902 (in Russian). Little Russia, J. Talko-Hryncewicz, "Charakterystyka fizyczna ludnosci zydowskiej Litwi i Rusi," *Zbior wiad. do antropol. Kraj.*, Vol. XVI, 1892. White Russia, M. G. Yakowenko, "Materials for the Anthropology of the Jews," St. Petersburg, 1898 (in Russian).

[2] S. H. Scheiber, "Untersuchungen über den mittleren Wuchs der Menschen in Ungarm," *Archiv für Anthropologie*, II, 1881, pp. 233–267.

For comparison of the Jews with the indigenous population of the countries in which they lived for centuries it has been deemed advisable to combine the figures obtained by measurement of the Jews in New York with those found in the anthropological literature of the Jews in eastern Europe. A fairly large number of observations are thus obtained, which may be expected to give more or less definite results. We have thus tabulated 1,141 Galician Jews (305 in New York and 836 in Galicia by Kopernicki); 515 Polish Jews (315 in New York and 200 in Poland by Elkind); 414 Lithuanian and White-Russian Jews (275 in New York and 139 in White Russia by Yakowenko); 657 Little-Russian Jews (219 in New York and 438 in Little Russia by Talko-Hryncewicz). These figures are placed in parallel columns with Galician Poles and Ruthenians (Majer and Kopernicki), Poles (Elkind), Letto-Lithuanians and White Russians (Talko-Hryncewicz), and Little Russians (Ivanowski) and Roumanians (Pittard).[1]

An analysis of the figures in this table confirms in a striking manner the similarity of the stature of the Jews to that of their non-Jewish neighbors. To begin with the average stature: In Galicia it is equal to that of the Poles of that country, and less than that of the Ruthenians who are known to be tall. In Poland the Jews are slightly taller, and here the Poles are also taller than those of Galicia. In White Russia and Lithuania the Jews are taller than those in the above-mentioned countries, and here we find that the indigenous population is also taller than the Poles; while in Little Russia, where the people are distinguished by their superior height (being among the tallest of races of European Russia) the Jews are also tall. Weissenberg found them here to measure 164.8 cm. in height, and Pan-

[1] Majer and Kopernicki, *loc. cit.;* A. D. Elkind, "The Poles of the District of Wisla," *Public. Soc. of Friends of Natural Science, Anthropol. and Ethnography*, Vol. XC, Moscow, 1897; J. Talko-Hryncewicz, "Charakterystyka fizyczna ludu ukrainskiego," *Zbior Widom. do. Antrop. krj.*, Vol. XIV; *idem.*, "Charakterystyka fizyczna ludow Litwi i Rusi," *ibid.*, Vol. XVIII; A. A. Ivanowski, "On the Anthropological Composition of the Races in Russia," *Public. Society of Friends, etc.*, Vol., CV., Moscow 1904 (in Russian); Eugene Pittard, "Anthropologie de la Roumaina," *L'anthropologie*, XIV, No. 1, 1903, pp. 33–58.

tukhof records the Jewish recruits in Odessa to be 165.6 cm. in height on the average, even taller than the Christian conscripts of that city. Even Snigireff's recruiting statistics show that the Jews measure here 164.2 cm. The Hungarians are also known to be tall, 164.6 cm., according to measurements of 77,579 Magyar soldiers,[1] and here, also, the Jews are taller, 165.7 cm. in height.[2] Finally the Roumanian Jews appear the tallest of the eastern European immigrant Jews in New York City. Pittard gives the average stature of the Roumanians as 165 cm.; the same average stature was found by measuring

TABLE VIII

STATURE OF THE JEWS COMPARED WITH THAT OF NON-JEWS IN VARIOUS COUNTRIES OF EASTERN EUROPE

Country.	Less Than 160.	160 to 164.9.	165 to 169.9.	170 and Over.	Less Than 165.	165 and Over.	Number.	Average Stature.	Observer.
Galicia.									
Jews.	35.93	33.22	20.24	10.61	69.15	30.85	1,141	1,623	Fishberg, Kop.
Poles.	13.67	32.93	28.90	24.50	46.60	53.40	2,861	1,622	Kopernicki.
Ruthenians.	21.78	26.47	22.94	28.81	48.25	51.75	1,355	1,640	"
Poland.									
Jews.	35.53	29.71	24.47	10.29	65.24	34.47	515	1,625	Fishberg, Elk.
Poles.	23.50	38.22	21.99	16.23	61.78	38.22	191	1,640	Elkind.
Lithua. and White Russ.									
Jews.	27.05	34.06	25.85	13.04	61.11	38.89	414	1,635	Fishberg, Yakowenko.
White Russ.	23.93	28.62	32.15	15.14	52.55	47.29	961	1,636	Talko-Hryncewicz.
Letto-Lith.	18.07	31.52	27.94	22.47	49.59	50.41	476	1,644	Talko-Hryncewicz.
Little Russia.									
Jews.	24.35	30.30	28.31	17.04	54.65	45.35	657	1,639	Fishberg, Talko-Hryncewicz.
Little Russ.	14.52	32.88	26.86	25.74	47.40	52.60	1,694	1,670	Ivanowski.
Roumania.									
Jews.	18.00	27.33	24.00	30.67	45.33	54.67	150	1,660	Fishberg.
Roumanians.	12.58	29.80	31.79	25.83	42.38	57.62	151	1,650	Pittard.

[1] Quoted from Deniker, "The Races of Man," p. 579.

[2] From Scheiber's statistics it would appear that the Magyars are shorter, only 161.9 cm., but he found the Jews superior in this respect, 163.3 cm. in height. The difference may be explained by the fact that the former statistics are from soldiers, a picked lot from which all short individuals have been eliminated.

59,761 Roumanian soldiers;[1] in Bukowina, Himmel records that the Roumanians reach 167.3 cm. in height.[2] We found no records in anthropological literature of measurements of Jews in Roumania, but from Himmel's measurements of 100 Jewish soldiers in Bukowina, they are shown to be quite tall, 165.7 cm. on the average.

It is noteworthy that the distribution of the classes of stature confirms this condition very strikingly. It appears from this table that the proportion of short individuals, less than 160 cm. in height, is everywhere larger among the Jews than among the Gentiles of the same country (excepting among the Roumanians, but here we deal with immigrants only, having no available statistics for Jews in their native country to combine with the statistics of the stature of the immigrants as was done with the other groups). But the percentage of these short individuals seems to run in almost direct ratio to the percentage found among the Gentiles in the same locality. In Galicia and in Russian Poland, where persons under 160 cm. in height reach over 20 percent, the Jews have 35 percent of short men; on the other hand, in Little Russia, where such people are found only to the extent of 14 percent, and in Roumania where it is only 12 percent among the Gentiles, the Jews show also a lesser proportion, 24 and 18 percent respectively. Persons of tall stature, 170 cm. in height and taller, are met with less frequently among the Jews than among non-Jews of the same country. Such persons are found to the extent of 10 percent among the Galician Jews, but the proportion increases in frequency as it increases among the Christians of a given country, and is found to be 17 percent among the Jews from Little Russia, and even 30 percent among the Roumanian Jews. That this is not an isolated case is shown by the fact that Talko-Hryncewicz, Majer and Kopernicki, and Otto Ammon mention the fact that in those parts of the country[3] where the general

[1] Deniker, *loc. cit.*

[2] See Himmel's "Körpermessungen in der Bukowina," reported by Weisbach, in *Mittheilungen Anthropol. Gesellschaft Wien*, XVIII, 1888, *Sitzungsbericht*, pp. 83–84.

[3] Little Russia, Galicia, Baden.

population is of tall stature, the Jews display the same characteristic, and the reverse.

The Influence of Social Conditions on Stature

The deficiency of the stature of the Jews as compared with their non-Jewish neighbors is an interesting topic for investigation. It is true that the difference is but slight, only one to three centimeters in favor of the Gentiles, but it is evident in almost every country where measurements have been taken. It is of scientific interest to inquire into the reasons why the stature of the Jews depends to a great extent upon the stature of their neighbors: wherever the latter are short of stature the Jews display the same characteristic, and the reverse; but what is most remarkable, they are always somewhat shorter than the Gentiles.

One reason may be the fact that the Jews are mostly town-dwellers, while nearly two thirds of the non-Jews live in the country. The Jews are only rarely engaged in agricultural pursuits. "The general rule in Europe," says Ripley, "seems to be that the urban type is physically degenerate."[1] Beddoe considers as proved that the stature of men in the large towns of Britain is lowered considerably below the standard of the nation and that such degradation is progressive and hereditary.[2] The same has been observed by Ranke in Bavaria,[3] Anutchin in Russia,[4] and by many others. Ripley[5] points out that "the unfavorable influence of city life is often obscured by the great social selection which is at work in the determination of the physical type of the population of great cities. While the course of the town type by itself is downward, oftentimes the city attracts another class which is markedly superior, in the same way that the immigrants of the United States have been distinguished in this respect." This advantage is of course not enjoyed

[1] *Loc. cit.*, p. 95.

[2] J. Beddoe, "On the Stature and Bulk of Man in the British Isles," *Mem. Anthr. Soc. London*, III, 1867.

[3] J. Ranke, "Der Mensch," Vol. II, p. 131.

[4] D. N. Anutchin, "On the Geographical Distribution of Stature of the Male Population of Russia, St. Petersburg, 1889, p. 165 (in Russian).

[5] *Loc. cit.*, pp. 95, 552–555.

by the Jews in Europe, because the numerical value of the Jewish rural population is almost insignificant. The superior stature of the Jews in the United States is to be ascribed to this very cause.

The wretched social, economic, and sanitary conditions under which the Jews labor in the eastern European ghettoes will also account for the deficiency they display in body height, when compared with their Gentile neighbors. As a matter of fact, in Galicia, where the economic conditions of the Jews are worst, they are shorter than any other class of Jews. Even the immigrants of the United States from this poor country are the shortest, as we have seen above. The artificial selection which influences favorably the average stature of immigrants had no effect at all on these Jews. In Poland, where the economic conditions are better, the Jews are taller; while in southern Russia the Jews are quite tall, corresponding possibly to superior economic conditions. The influence of poverty and social conditions on the stature of the Jews has been illustrated in a striking manner by Zakrzewski in his work "Ludnosc miasta Warszawy."[1] He prepared maps showing the social status of the various districts in Warsaw, the capital of Poland, and the average stature of the Jews and Poles in that city. A comparison of these maps shows in a striking manner how shortness of stature goes hand in hand with poverty. Another indirect proof of this theory is the increase of stature of the first generation of Jews in New York City, where the social and economic conditions are much improved.

The Jews are mostly engaged in indoor occupations. Seven hundred and twenty of the 1,528 individuals investigated in New York (47.12 percent) were working indoors. That workingmen who spend most of their time in closed rooms, particularly amid insanitary surroundings, such as generally exist in sweatshops, are shorter of stature, is well known. Ripley ascribes it to two causes, the first of which is artificial selection. "The physically well developed men seek certain trades or occupations in which their vigor or strength may stand them in good stead; on the

[1] *Materiali antr.-archeol. Akad. umiej.*, Krakow, I, dzial I, pp. 1–38.

other hand, those who are by nature weakly, and coincidently often deficient in stature, are compelled to make shift with some pursuit for which they are fitted. Thus workers in iron, porters, firemen, policemen, are taller as a class than the average, because they are of necessity recruited from the more robust portion of the population. In marked contrast to them, tailors, shoemakers and weavers, in an occupation which entails slight demands upon the physical powers, and which is open to all, however weakly they may be, are appreciably shorter than the average." The second cause is the result of the effects of the habits of life or of the nature of the employment. The conditions in the sweatshops act adversely on the physique of the younger tailors. Add to this the cramped position in which they work, the long hours, the insanitary surroundings, etc., and all the conditions tending to physical degeneracy are found.[4]

TABLE IX

STATURE AND OCCUPATION

Occupation.	Number Observed.	Average Stature (cm.).	Short Stature.	Stature below the Average.	Stature above the Average.	Tall Stature.
Indoor.						
Tailors.	372	161.3	32.79%	33.33%	22.05%	11.85%
Cobblers.	79	160.4	37.98	26.58	27.80	11.83
Fact'y workers.	269	162.2	26.39	27.89	30.11	15.61
Total indoor.	720	162.0	30.98	30.58	25.69	12.17
Outdoor.						
Carpenters.	89	164.9	19.10	31.46	28.09	21.35
Iron-workers.	68	166.3	20.59	26.47	27.94	25.00
Masons.	44	167.9	15.92	31.83	28.09	21.35
House painters.	58	167.5	15.52	25.86	31.03	27.59
Laborers.	85	166.8	29.41	22.35	29.41	18.83
Total outdoor.	344	166.4	20.93	27.32	28.78	22.97
Mercantile.						
Merchants.	163	168.7	16.56	27.61	31.90	28.83
Clerks.	105	169.2	11.42	35.21	26.67	26.67
Peddlers.	130	164.3	18.47	37.69	26.15	17.69
Professional.	66	169.6	9.04	22.73	33.33	34.85

In order to determine whether the peculiar occupations of the Jews had any effect on their average stature, I have classified

[1] W. Z. Ripley, "Races of Europe," pp. 89–93.

the material according to the occupations of the people who submitted to measurement. The average stature of each class was calculated, and also the percentage of people of tall, medium, and short stature among them. Among these 1,528 men under consideration, 720 (47.12 percent) were engaged in indoor occupations, including the various branches of tailoring, cobblers, cigar-makers, weavers, bakers, etc.; 344 (22.51 percent) were working outdoors, including carpenters, house painters, masons, ironworkers, etc.; 398 (26.65 percent) were engaged in mercantile pursuits, as clerks, etc., 130 were peddlers; 66 in the class generally termed professional, including the liberal professions as well as students. The accompanying table (IX) shows the results of this inquiry. It will be observed that the tallest are the professional men, reaching 169.9 cm. in height. They also had the largest proportion of tall men—34.85 percent. The clerks and merchants come very close with 169.2 and 168.7 cm. respectively, in height. Besides these we note the peddlers, who though classed with the merchants, still are rather short, only 164.3 cm. The reason is apparent; the percentage of short people among them was 18.47; of tall, 170 cm. and over, only 17.60. Coming to the people engaged in outdoor occupations we note that their average stature was 166.4 cm., two cm. above that for the Jews in New York City. Nearly 23 percent of them were 170 cm. or more as against only 19 percent among Jews generally, and while the latter show 23.3 percent of short people averaging less than 160 cm. in height, such who are engaged in outdoor occupations have only 20.93 percent of such deficient persons.

Masons and house painters were the tallest of this class, while the carpenters were the shortest. When we come to consider those engaged in indoor occupations, we are at once struck by the alarming proportion of short people, 30.98 percent were less than 160 cm. in height, and in addition to this the proportion of tall persons, 170 cm. and over, are found to be only 12.17 percent. We may add that only one of these was 178 cm., six feet tall, and he was not a tailor in his early years; only after emigrating to the United States at the age of twenty-one did he

learn the trade. Their average stature is only 162 cm., 2.5 cm. (one inch) shorter than the general average for the Jews in New York City. Deplorably deficient in this regard were found the cobblers and tailors, 160.4 cm. for the former, and 161.3 for the latter. The proportion of short men was 32.79 percent among the tailors and nearly 38 percent among the shoemakers.

These figures, though based on comparatively few observations, tend to show that the deficiency in the Jews' stature, as compared with the other races in eastern Europe, may at least partly be ascribed to the wretched social and economic conditions under which they find themselves within the gates of eastern European ghettoes. Dr. S. Weissenberg also observed that the stature of the Jews in southern Russia depends greatly on their occupations and social status, and Zakrzewski's maps of the city of Warsaw confirm this in Poland, the largest Jewish center in Europe. The first generation of Jews in New York City, who only rarely work at indoor occupations and lead a more active open-air life, which is conducive to normal growth and development, are also taller. This condition also shows that the shortness of stature of the Jews is due in a great measure to their social conditions and environment.

The influence of occupation, active open-air life, and general prosperity on the stature of the Jews is best seen from Mr. Joseph Jacobs' measurements of English Jews. He found the average height of Jews in London to be 164.1 cm. (65 inches), but the Jews living in the "West-End" of London were much taller, averaging 171.4 cm. (67.5 inches). Jacobs attributes this superior stature of the "West-End" Jews to their superior "nurture" and social conditions generally.[1] An analysis of the stature of the Jews born in the United States, as compared with that of their foreign-born parents, confirms Jacobs' observations on English Jews. Among the 1,528 Jews under consideration, 124 were native born. Their average stature was 167.9 cm., as against 164.2 cm. for the 1,404 Jews of foreign birth. This

[1] Joseph Jacobs, "On the Comparative Anthropometry of English Jews," *Journal Anthropological Institute, London*, XIX, 1890, pp. 76–88.

shows an increase of 3.7 cm. in the first generation. The increase in stature is better displayed in the accompanying table showing the proportion of individuals at a given class of stature accordingly to the four divisions of stature in which our material has been divided.

TABLE X

STATURE OF NATIVE AND FOREIGN JEWS

Stature.	Foreign Jews.		Native Jews.	
	Number.	Percent.	Number.	Percent.
Short.	345	24.57	11	8.87
Below the Average.	430	30.63	30	24.19
Above the Average.	379	26.99	41	33.07
Tall.	250	17.81	42	33.87
Total.	1404	100.00	124	100.00

From this table we find that while among the Jews born in eastern Europe 24.57 percent were of short stature (less than 160 cm.), there were only 8.87 percent of native Jews thus deficient in body-height. On the other hand, of tall men, 170 cm. in height and upward, there are among the native Jews 33.87 percent, as against only 17.81 percent among their immigrant parents. The proportion of persons of medium height, 160 to 170 cm., is about the same in both groups.

We can see in this a process of double selection at work. The immigrants are taller on the average than the people from whom they spring, as we have seen. That stature is transmitted by heredity is not to be questioned. When to this are added other factors which are favorable to healthy growth of the body, we have good reasons for the superior stature of the native American Jews. Here, during the period of most active growth, the Jewish child attends a modern public school instead of the insanitary *cheder* (Jewish school) in eastern Europe; during adolescence the Jew here engages mostly in outdoor occupations instead of the sweatshop which is the workshop of many of the immigrant Jews (only five of the 124 native Jews were engaged at work in sweatshops). Besides this, the native Jewish youth in the East side in New York City enjoys

quite freely open-air recreation, games, bicycle riding, etc., all of which are conducive to healthy growth and development of the body.

The superior stature of the native American Jews is thus seen to be a result of superior social conditions and environment.

Stature of Women

The average stature of 435 women examined by the present writer is 153.5 cm. (5 feet, 0.4 inch). They are thus 11 cm. shorter than the men. The ratio of stature of men and women is 1 to 0.931 or as 16 to 14.88, which is exactly the ratio of adult men and women in England.[1] The absolute difference in stature between men and women is about the same as generally observed in other races, as can be seen from Deniker's study of 35 series of measurements of women; that in 20 cases out of 35, *i. e.*, almost two thirds, the difference in height between the two sexes in any given population hardly varies more than from 7 to 13 cm. (3 to 5 inches); 14 times out of 35 it varies only from 11 to 12 cm., so that the figure of 12 cm. may be accepted as the average.[2] From investigations of Professor Franz Boas among American Indians, it is seen that among the taller aboriginal American races the stature of the women is 92 percent of that of the men, while among the shorter races the percentage reaches 94.[3]

The tallest Jewess examined was 170.3 cm., being 16.8 cm. or 10.94 percent taller than the average. The shortest was 133.4 cm., being 20.1 cm. or 13.99 percent shorter than the average. In general the extreme variation extended over 36.9 cm., or 24 percent of the average. All these values are much smaller than those presented by the men, thus showing a smaller range of variability of stature of the women. The standard deviation was found to be 6.20, which is practically the same as that for

[1] There the stature of men is 170 cm. and of women 160 cm.; the ratio is thus as 16 to 14.88. See Report of the Anthropometric Committee of the British Association, 1883.

[2] J. Deniker, "The Races of Men," London, 1900, p. 33.

[3] Franz Boas, "Zur Anthropologie der nordamerikanischen Indianer," *Verhandlung. d. Berliner Anthropologischen Ges.*, 1895, pp. 74.

the men (6.58), while the probable error is 0.20 — larger than that of the men (0.1133). This is due to the smaller number of observations on women, because the average is more accurate, and the probable error consequently smaller, the larger the number of individuals measured.

Arranged in groups of tall, short, etc., we find the following distribution:

	Number.	Percent.
Short (139 cm. and less)	7	1.61
Below the average (140 to 152 cm.)	186	42.76
Above the average (153 to 157 cm.)	142	32.65
Tall (158 and above)	100	22.98
Total	435	100.00

TABLE XI

STATURE OF JEWESSES

Height (in cm.).	Number.	Percent.	Height (in cm.).	Number.	Percent.
133–134	1	0.23	153–154	58	13.34
135–136	2	0.46	155–156	65	14.94
137–138	2	0.46	157–158	39	8.96
139–140	5	1.15	159–160	37	8.51
141–142	9	2.07	161–162	20	4.59
143–144	10	2.29	163–164	6	1.38
145–146	39	8.96	165–166	7	1.61
147–148	40	9.19	167–168	9	2.07
149–150	39	8.96	169–170	1	0.23
151–152	46	10.57	Total.	435	99.97

The seriation of the values obtained by measurement is shown in Table XI, and a curve drawn from these figures may be seen in diagram I. Here we observe a narrow pyramid, much higher and narrower than the one for the stature of the men, showing a lesser degree of variability, on the part of the women. The apex points at 152 cm., where nearly fifteen percent of the observations are found.

No definite conclusions can be drawn from the figures in Table XII, showing the individual variations in the stature of Jewesses according to their nativity. The number of observations in each group is too small to give reliable results. Adapting, however, the plan pursued while discussing the stature of the Jews, it is

Table XII

Stature of 435 Jewesses According to Their Nativity

Stature (in cm.).	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.
133–134	—	1.79	—	—	—	—
135–136	—	1.79	1.00	—	—	—
137–138	1.64	—	—	—	—	—
139–140	3.28	—	1.00	—	—	—
141–142	3.28	3.57	1.00	—	2.27	2.56
143–144	1.64	—	4.00	2.70	4.55	2.56
145–146	11.48	8.93	7.00	12.16	2.27	7.69
147–148	11.48	8.93	12.00	6.76	4.55	5.13
149–150	6.55	14.29	11.00	9.46	2.27	10.26
151–152	13.11	12.50	12.00	4.05	11.36	7.69
153–154	7.38	12.50	14.00	18.92	20.45	12.82
155–156	20.49	17.86	13.00	6.76	15.91	12.82
157–158	4.09	3.57	10.00	12.16	13.64	17.95
159–160	9.02	8.93	10.00	5.41	6.82	7.69
161–162	1.64	3.57	2.00	10.81	11.36	2.56
163–164	1.64	—	—	2.70	2.27	2.56
165–166	1.64	—	1.00	2.70	2.27	2.56
167–168	1.64	1.79	1.00	4.05	—	5.13
169–170	—	—	—	1.35	—	—
171–172	—	—	—	—	—	—
No. measured.	122	56	100	74	44	39
Av. stature.	152.4	152.2	153.7	154.6	154.5	154.4

found that the Jewesses confirm in a large measure the conclusions reached in the discussion of the former. This is seen in Table XIII, giving the stature of the Jewesses in New York and in eastern Europe in four classes,— small, below the average, above the average, and tall,— for such as statistics were obtainable in anthropological literature.

Table XIII

Stature of Jewesses in the United States and in Eastern Europe

Stature (in cm.).	Poland.		Lithuania and White Russia.		Little Russia.	
	N. Y.	Poland.	N. Y.	Lithuania.	N. Y.	Little Russia.
–140	3.57	0.8	1.0	5.0		1.45
140–152.9	48.21	67.2	48.0	57.0	35.14	59.22
153–157.9	30.36	22.4	31.0	25.0	32.43	23.80
158 +	17.86	9.6	20.0	13.0	32.43	15.53
No. observed.	56	125	100	100	74	206
Average.	152.2	150.0	153.7	150.7	154.6	151.5

This shows that the immigrant Jewesses are on the average taller than those in eastern Europe. In Poland Elkind found the average stature of the Jewesses in Warsaw to be 150.4 cm., while the immigrants from that country are 152.2 cm.; Lithuanian and White-Russian Jewesses average 150.7 cm. in height at home (Yakowenko), and 153.7 in New York; and Little-Russian Jewesses are 151.5 cm. (Talko-Hryncewicz) in southern Russia and 154.6 cm. in New York. The proportion of tall Jewesses (over 158 cm. in height) is also larger among the immigrants in the United States than among those in their native homes — 17.86 percent against only 9.6 percent among the Polish; 20 against 13 percent among the Lithuanian, and even 32.43 percent against 15.53 among the Little-Russian Jewesses. It appears, however, that short Jewesses, measuring 140 cm. or less, are more frequently encountered among the immigrants than in eastern Europe, reaching even 3.57 percent among the Polish Jewesses in New York.

TABLE XIV

STATURE OF JEWESSES COMPARED WITH EASTERN EUROPEAN WOMEN

Stature.	Poland.		Lithuania.			Little Russia.	
	Jewesses.	Poles.	Jewesses.	Letto-Lithuanian.	White Russian.	Jewesses.	Little Russian.
−140	1.66	—	3.0	—	—	1.07	—
140–152	61.33	46.31	52.5	33.96	43.97	52.86	22.98
153–157	24.86	36.23	28.0	45.29	31.92	26.07	39.57
158 +	12.15	17.45	16.5	20.75	24.11	20.00	37.45
Number.	181	149	200	106	141	280	235
Average.	151.7	153.3	152.2	152.6	152.3	152.6	154.5

When compared with non-Jewish women in the same country, the Jewesses are shorter in stature by one to two cm., and persons 140 cm. in height and less are entirely absent among the non-Jewish women. The proportion of tall women, 158 cm. and over, is much smaller among the Jewesses. But here we may also note the phenomenon observed when considering the men: the proportion of tall individuals is in direct ratio to the proportion of such persons found among the Gentile women. The Polish women have only 17.45 percent of women over 157 cm.

in height, and the Jewesses from that country, 12.15 percent. In Lithuania and White Russia we find tall women among the Letto-Lithuanians to the extent of 20.75 percent, among the White Russians 24.11 percent, and the Jewesses from this region of Russia show 16.5 percent. Among the Little Russians, who are known among the tallest Slavonians, the Jewesses have 20 percent of persons over 157 cm. in height, perhaps because the Gentiles here have 37.45 percent of tall women.

It thus appears that notwithstanding the fact that we deal here with only a limited number of observations, measurements of only 661 Jewesses being available, the results confirm the conclusions reached when studying the men. Their stature depends greatly on the stature of the indigenous population of the country of their birth. Wherever the Gentiles are short of stature, the Jews also are short,and the reverse.

CHAPTER III

The Girth of the Chest

Discussions on the girth of the Jewish chest occupy many many pages of the anthropological literature of the Jews. As is well known, the girth of the chest exceeds, or at least equals, one half the body height in most people. The measurements taken on thousands of Jewish conscripts in the eastern European armies have shown the Jewish recruits to be deficient in this regard. From Snigirew's extensive statistics it is seen that measurements taken on 4,470 Jewish recruits in Poland have given an average circumference of the chest of 80.1 cm. (31.5 inches). As their average stature was 162.2 cm., the girth of their chest was only 49.68 percent of their body height. Among 2,122 Jews in Lithuania the same authority has found a girth of only 49.55 percent of their stature. Majer and Kopernicki have found that the girth in 569 Galician Jews was only 49.2 percent. The non-Jewish population of these countries have a chest girth which exceeds half their body height by from two to eight percent. This deficiency of the Jews in girth has given rise to a considerable amount of discussion as to whether the Jews, owing to their deficiency in "vital capacity" and having a lesser "index of vitality" are fit for military duty.[1] Ripley, in reviewing this subject, says that the Jews are "anthropologically as well as proverbially, narrow chested.[2]

Of the Jews recorded in this work only 983 have been examined as to the circumference of the chest. Many submitted to the ordeal of having their heads, etc., measured, but they declined to undress for the purpose of having their chest measured. Among these we find an average girth of 85.87 cm., or 52.2 per-

[1] See Snigirew, "Materials for Medical Statistics and Geography of Russia," *Voyeno-Medizinsky Zhurnal*, 1878–9; Goldstein, "Des circonférences du thorax et de leur rapport à la taille," *Revue d'Anthropologie*, serie 2, VII, pp. 460–485; B. Blechman, "Ein Beitrag zur Anthropologie der Juden," Dorpat, 1882.

[2] Races of Europe, p. 582.

cent of their stature (85.87 ÷ 164.5 = 52.2). The man with the largest chest measured 109 cm., while one had a girth of only 70 cm. This shows that the extreme variations extended over 39 cm., or 45.46 percent of the average, which is much larger than the extreme variations found for stature. The fact that the size of the chest is much more exposed to various external influences than is stature, accounts for it. It also shows that the chest can not be considered a stable racial character.

TABLE XV

GIRTH OF THE CHEST

Girth (in cm.).	Number.	Percent.	Girth (in cm.).	Number.	Percent.
69–70	1	0.10	91– 92	63	6.41
71–72	4	0.40	93– 94	51	5.19
73–74	16	1.63	95– 96	16	1.63
75–76	31	3.16	97– 98	14	1.43
77–78	56	5.70	99–100	9	0.92
79–80	96	9.77	101–102	4	0.40
81–82	116	11.80	103–104	3	0.30
83–84	135	13.73	105–106	2	0.20
85–86	144	14.65	107–108	2	0.20
87–88	120	12.21	109–110	1	0.10
89–90	99	10.07	Total.	983	100.00

In the accompanying Table XV are given the individual variations of the girth of the chest at intervals of 2 cm. It is to be seen that the largest number of people had a girth of 85–86 cm., corresponding to the average and the median. Above and below this value the proportion of persons at a given girth is progressively growing smaller. This points to a certain uniformity of type which is observed in almost all the somatic characteristics of the Jews.

The fact disclosed by these figures that the immigrant Jews in New York have a girth of chest which exceeds half their stature by 3.6 cm. does not contradict the figures quoted from Snigirew, Kopernicki, etc. A careful inquiry reveals that the deficiency in girth of the Jews is not a racial trait, but entirely due to social conditions and tardy development. The Jewish children are known for their precocity in mental and intellectual development. The success they have in the public schools

bears good witness to this. But as regards their physical development the Jewish youth is very slow. While the Slavs among whom they live reach their full growth at 21 to 25 years of age, the Jews do not reach their full height until the age of 30 and even later. Weissenberg, Elkind, Majer, and others have shown this to be the case with the Jews in eastern Europe. From materials collected by the author, to be published in due time, this also appears to be the case with the Jews in the United States. This condition must be considered while speaking of their girth. It is a striking fact that wherever data have been collected on conscripts whose ages range between 20 and 21 years, when they have not yet reached their full development, the results show that the girth is less than half their body-height. On the other hand, all the measurements which were taken on the general Jewish population, including all ages above 21 years, show quite different results. Weissenberg found that the girth of the Jews in southern Russia is 53.6 percent of their stature; Yakowenko in White-Russia, 52.45 percent; Elkind in Poland, 51.57 percent, etc. Our own measurements give a result of 52.2 percent. All this is explained by the age of the persons measured. Those less than 22 years are deficient in girth; those above this age are fairly well developed, because, as has been statistically shown by Weissenberg and Elkind, the bodies up to the age of adolescence grows very rapidly in length, while the width of the body does not grow correspondingly. After twenty years the growth in width begins to be more active, and continues even after the growth in height has ceased. The girth keeps on increasing in size up to the age of 40 and even 50 years.

The causes of this tardy development are to be sought in the social conditions of the Jews. The Jew in eastern Europe does not enjoy during his childhood any games and outdoor exercises, but is confined the greater part of the day in the *cheder* (Jewish school), which is always in a deplorable sanitary condition. During adolescence his sedentary habits, indoor domestic occupations, and the absence of physical culture are conspicuous. All this does not contribute much to

the healthy development of their muscular system and their chests remain flat and contracted. It must be recalled that the girth depends not only on the size of the skeleton, but also, in a great measure, on the condition of the muscular system. Well developed muscles will enlarge the circumference of the chest with their bulk, and weak, flabby muscles do not elevate the ribs upward to a perceptible extent, but permit them to hang down at an acute angle in relation to the spinal column, thus reducing the size of the girth. Individuals with strong, well-developed muscles have consequently large chests. The absence of agricultural laborers among the Jews is also an important factor. The rural population is known to have a larger girth than the town dweller, as is the case with the factory worker, who is at a disadvantage in this regard when compared with the outdoor laborer. It has also been observed that the more intellectual classes are quite often deficient with respect to their girth. Otto Ammon, speaking of this condition, mentions that the Jews are deficient in their chest capacity because they are assiduously engaged in study in a sitting posture and because they so frequently engage in mercantile pursuits.[1] He ascribes this defect of the physical organization of the Jews mostly to their faulty muscular development.

For 118 native Jews of New York City we have found the average circumference of the chest to be 88.09 cm., which is more than 2 cm. larger than that of the immigrant Jews in this city, but when considered in relation to stature we find no improvement at all. As the average stature of the native Jews is 1,679 mm., the girth is only 52.46 percent of the body-height, which is about the same as that of their foreign parents. This confirms Ripley's opinion that, even if granted that the narrow chest of the Jews is an acquired characteristic, the effect of long-continued subjection to unfavorable sanitary and social environment, it has none the less become a hereditary trait.

The relations of stature to girth is interesting. Pantukhof has observed in Odessa, southern Russia, that the chest of the taller Jews was more capacious than that of the Jews of inferior

[1] Otto Ammon, "Die natürliche Auslese beim Menschen," Jena, 1893, p. 134.

stature. He considers it another proof of the greater vitality of the "Aryan" elements among the Jews, particularly because the taller Jews were also fairer in complexion than were the shorter Jews.[1] From our own measurements we find that the relations of chest girth to stature was as follows :

Stature.	Average stature.	Average girth.	Percent of stature.	Number of Observations.
Tall stature.	173.4	88.03	50.76	204
Above average.	167.2	86.19	51.58	280
Below average.	162.6	84.36	51.88	288
Short.	156.1	83.12	53.25	205
All Jews.	164.5	85.87	52.2	977

This shows that the *absolute* average girth of the chest increases with the increase of stature, but that the *relative* size of the chest decreases. In other words, the shorter men had relatively larger chests than the taller men. Thus, those who were shorter than 160 cm. in height had chests averaging only 83.12 cm. ; those who were 170 cm. and taller had an average chest circumference of 88 cm. But relative to stature the shorter people had a girth of 53.25 percent of the height of the body, while the taller individuals' girth was only 50.76 percent of their stature. If we accept the average girth for all Jews at 85.87 cm., or 52.2 percent of their stature, as the type of the chest for the Jews in New York, then we should expect that each of these groups would have the following girth :

Stature.	Calculated Girth.	Observed Girth.	Difference.
Tall.	90.53	88.03	—2.50
Above average.	87.23	86.19	—1.04
Below average.	85.08	84.36	—0.72
Short.	81.48	83.12	+1.64

Which shows that the tall Jews had a girth 2.5 cm. (one inch) shorter than the average; that those above the average stature had a girth 1.04 cm. shorter than the average, while the Jews

[1] I. I. Pantukhof, "Semitic types," *Proc. Russian Anthropological Society*, St Petersburg, Vol. II, 1889.

who were short of stature had a girth of 1.64 cm. larger than the average.

This condition is interesting from another standpoint. The average stature of Jewish consumptives has been observed to be superior to that of healthy Jews. The extensive statistics of Snigirew have shown that among Jewish recruits in Russia the relation of stature to girth has been as follows among healthy and consumptive Jews, respectively:

	Average for all Jewish Recruits.	Average for Jewish Consumptives.	Difference.
Stature.	1612	1628	—1.54
Girth of chest.	80.18	75.95	—4.23
Relation of girth to stature (percent).	49.68	46.64	—3.04

The figures in this table show that the Jewish consumptive is taller than the normal Jew, but that the girth of his chest is both absolutely and relatively smaller than that of healthy Jews. He is deficient in his "index of vitality," as Goldstein speaks of it.[1] My own observations on Jewish consumptives, as yet unpublished, show that this condition also prevails among the consumptive Jews in New York City. Consumption seems to select its victims preferably among the taller Jews. Judt thinks that this factor, by a natural elimination of the taller Jews, exerts a great influence in reducing their average stature.[2]

The girth of the Jews from various countries varies only slightly, as can be seen from the following figures:

Nativity.	Number.	Girth.	Percent of Stature.
Galicia.	191	83.93	51.74
Poland.	173	85.53	52.34
Lithuania.	126	84.93	51.72
Little Russia.	108	85.00	51.30
Roumania.	146	84.41	50.85
Hungary.	121	86.30	52.08
United States.	118	88.09	52.46

[1] *Loc. cit.*

[2] J. M. Judt, "Die Juden als Rasse," Berlin, 1903, p. 85.

The Galician Jews are the narrowest in girth, as they are also the shortest of stature. The most capacious chest, on the average, is found among the native Jews, but it is only 52.46 percent of their body height, the same as among the Polish Jewish immigrants. The Roumanian Jews, who are the tallest immigrants, have relatively the narrowest chests, their girth being only 50.85 percent of their average stature.

CHAPTER IV

The Head

The Length of the Head

The average length of the head, measured with the calipers from the glabella to the most distant point on the occiput, was found to be 188 mm., or 11.43 percent of the body-height. The range of extreme individual variation extended from 169, the shortest, to 208 mm., the longest head, a difference of 39 mm., or 20.74 percent of the average length of the head. This is much smaller than the range of individual extreme variation observed in the case of stature (31 percent). This confirms the accepted dictum that the head is far less variable than the height of the body, probably because it is less, or not at all, exposed to the influence of external conditions, such as climate, nourishment, and social status.

TABLE XVI

LENGTH OF THE HEAD, 1,528 MEN

Length of the Head (in mm.).	Number.	Percent.	Length of the Head (in mm.).	Number.	Percent.
169–170	4	0.26	191–192	186	12.18
171–172	5	0.36	193–194	122	7.98
173–174	10	0.65	195–196	92	6.02
175–176	20	1.31	197–198	62	4.06
177–178	34	2.22	199–200	33	2.16
179–180	90	5.89	201–202	23	1.51
181–182	105	6.87	203–204	7	0.46
183–184	136	8.90	205–206	10	0.65
185–186	204	13.35	207–208	2	0.13
187–188	181	11.85			
189–190	202	13.22		1,528	100.03

The standard deviation was calculated to be 6.129, and the probable error 0.105, both of which are nearly the same as was found for stature. The range of individual variation is shown in the accompanying table (XVI) giving the seriation of the length of the head at intervals of two millimeters. The curve drawn

from these figures shows that there were few individuals with heads less than 176 mm. in length; the largest proportion of persons had heads 185–186 mm. long, and very few persons had heads more than 200 mm. long. At 189–190 mm. the curve appears to rise almost to the same height as at 186 mm., and thus gives the curve the appearance of having a double apex.

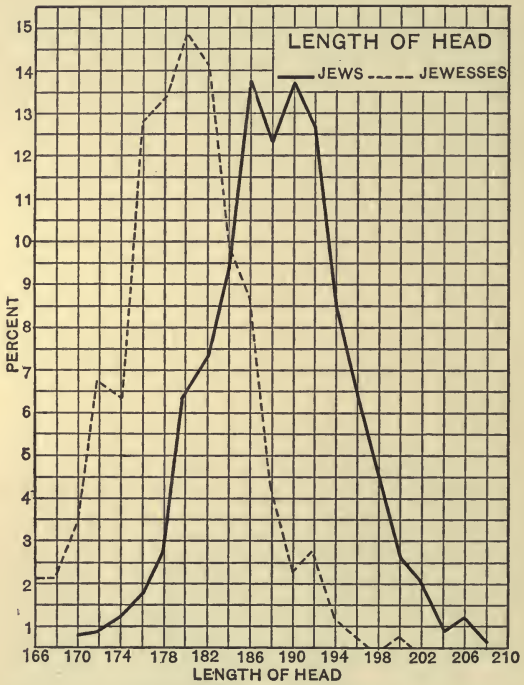

FIG. 4.— Relative length of head of Jews and Jewesses.

This and also the fact that the apex of the curve, representing the largest percentage of individuals, does not correspond to the average length of the head, 188 mm., may give the impression that here is good proof that we deal with a mixture of two races, one whose average length of the head is 186 mm. and the other with a head 190 mm. long. While this does not exclude racial intermixture, to be sure, it must be confessed that it does not prove it. The interval between the two maxima ex-

tends over only four mm., and the apices rise only a little over one percent. This may easily be produced by chance variation, individual error of observation. Two thirds of all the individuals observed had heads between 183 and 194 mm. long, which clearly points to a single type of head, not to two types. On the other hand all these facts do not justify us in assuming that this is conclusive proof that the Jews are a pure race, free from any intermixture of foreign blood. The races among whom the Jews have lived for centuries in eastern Europe, and with whom they might have intermarried, if at all, show the same characteristic, and have nearly the same average length of head, as can be seen from the following figures:[1]

		Average Length of Head.	Authority.
1,056	Great Russians	185 mm.	A. A. Ivanovski.
602	White Russians	188	
611	Little Russians	184	
540	Poles in Russia	186	
1,088	Poles in Galicia	180.5	Majer and Kopernicki.
871	Galician Ruthenians	182.3	" "
180	Roumanians	185.76	Pittard.
130	Lithuanians	187	Ivanovski.

The length of the head of these races is seen from these figures to be between 180 and 188 mm. If the usual discrepancies which often occur between the different series of measurements of even a single and homogeneous race are eliminated, we find that the length of the head of the Slav races is about 183 to 187 mm. When we now investigate the anthropological literature of the Jews in Europe we find a remarkable similarity of conditions. As can be seen from the following figures the length of the head of the Jews in eastern Europe also oscillates around these values.

[1] These figures are taken from the following works: A. A. Ivanowski, "On the Anthropological Composition of the Races of Russia," *Memoirs of the Society of Friends of Natural Science, Anthropology and Ethnography*, Vol. XXII, 1894 (in Russian); Majer and Kopernicki, "Charakterystyka fizyczna ludnosci galicyjskiej," *Zbior viadomosei do antropologii krajowej*, Vol. I, Krakow, 1877; Eugene Pittard, "Anthropologie de la Roumania," *L'anthropologie*, Vol. XVI, No. I, 1903, pp. 33–58.

	Average Length of Head.	Authority.[1]
200 Polish Jews	184 mm.	Elkind
438 Little Russian Jews	185.4	Talko-Hryncewicz
69 Lithuanian Jews	187.3	" "
413 Galician Jews (Series I)	183	Majer and Kopernicki
(Series II)	186	" "
100 Russian Jews	188	Blechman
100 South Russian Jews	183	Weissenberg
139 White Russian Jews	183	Yakowenko
67 Russian Jews	187	Dybowsky

It will be observed that the length of the head among the eastern Europen Jews varies in the various series of measurements from 183 to 188 mm. As will appear hereafter in places where the non-Jewish population has a longer antero-posterior diameter of the head, the Jews show the same characteristic. It can consequently be stated that if any intermixture of Jews with their neighbors has taken place, we could not expect that this should be shown in a striking manner in the seriation of the measurements of their heads. The difference is too small to produce any appreciable effect on the average.

From the measurements of the Jewish immigrants in New York City the following are the averages of the length of the head of Jews from various countries. Galician Jews, 186 mm.; Polish, 188 mm.; Lithuanian and White Russian, 190 mm.; Little Russian, 188 mm.; Roumanian, 187 mm.; Hungarian, 188 mm.; United States, 190 mm. These figures show that this measurement is larger in the immigrants than in Jews living in eastern Europe. There Majer and Kopernicki found the length of the head to average 183 mm.; in Poland Elkind found in Jews in Warsaw an average of 184 mm.; in Lithuania it was 187 according to Talko-Hryncewicz, and in Little Russia,

[1] These figures are taken from the following works: A. N. Elkind, "The Jews," *Memoirs of the Society of Friends of Natural Science, Anthropol. and Ethnography*, Vol. XXII, 1902; J. Talko-Hryncewicz, "Charakteristyka fizyczna ludnosci zydowskiej Litwy i Rusi," *Zbior wiad. do antropol. kraj.*, Vol. XVI, 1892; Majer and Kopernicki, *loc. cit.*; B. Blechman, "Ein Beitrag zur Anthropologie der Juden," Inaug.-Dissert. Dorpat, 1882; Weissenberg, "Die südrussischen Juden," *Archiv für Anthropologie*, Vol. XXIII, 1895; M. G. Yakowenko, "Materials for the Anthropology of the Jews," St. Petersburg, 1898 (in Russian); L. Stieda, "Ein Beitrag zur Anthropology der Juden," *Archiv für Anthropol.*, Vol. XIV.

185. This explains the greater dolichocephaly of the immigrant Jews when compared with those who remained at home. It is also noteworthy that this measurement depends to a certain extent on the size of the head of the non-Jewish races of eastern Europe. Thus in Galicia the length of the head of the Poles is 180.5 mm. on the average, and the Ruthenians 182.3 mm., being the shortest heads among the races in that region (Majer and Kopernicki); the immigrant Jews from that country measure only 186 mm. on the average; in Russian Poland, where the indigenous population have longer heads, 186 mm. (Ivanowski); the Jews also have longer heads, 188 mm.; in White Russia the White Russians have longer heads, 188 mm. (Ivanowski); the Jewish heads are also longer, 190 mm. The differences are very small, to be sure, but considering the fact that the numbers run so closely, smaller where the length of the head

Table XVII

Length of Head of 1,528 Jews According to Nativity

Length of the head (in mm.).	Galicia.	Poland	Lithuania and White Russia.	Little Russia	Roumania.	Hungary.	United States.
169–170	0.98	—	—	—	—	—	0.80
171–172	0.32	0.63	—	0.45	—	0.72	—
173–174	0.98	0.95	0.36	0.91	—	0.72	—
175–176	1.64	0.63	0.73	2.28	3.33	0.72	—
177–178	2.63	2.54	0.36	0.91	4.00	5.00	1.61
179–180	8.19	5.11	5.46	4.57	7.33	7.14	2.42
181–182	10.82	5.11	2.54	8.22	9.33	7.14	5.65
183–184	10.49	7.93	6.91	7.31	10.67	11.43	9.68
185–186	16.73	12.68	17.82	12.79	12.67	8.57	4.03
187–188	11.15	12.38	8.37	14.16	12.67	13.57	12.90
189–190	13.11	11.11	14.55	11.88	14.00	12.86	17.74
191–192	10.49	16.51	*11.63	11.42	10.67	10.71	11.29
193–194	4.59	7.61	9.44	11.42	6.67	8.57	8.87
195–196	3.61	7.93	10.18	5.48	3.33	2.14	6.45
197–198	1.64	3.81	4.73	2.28	4.00	6.43	9.68
199–200	0.65	2.22	4.00	1.82	0.67	2.86	3.23
201–202	0.98	1.59	1.82	1.82	—	1.43	3.23
203–204	0.32	0.32	0.36	0.91	—	—	1.61
205–206	0.65	0.95	0.36	0.91	0.67	—	0.80
207–208	—	—	0.36	0.45	—	—	—
No. observed.	305	315	275	219	150	140	124
Average.	186	188	190	188	187	188	190
Maximum.	206	206	207	208	205	201	205
Minimum.	169	171	173	171	175	171	170

of the non-Jewish races have smaller heads and larger where the non-Jewish races have larger heads, it is worthy of mention. This is of importance also because many of the other somatic characteristics of the Jews, as stature, head-form, etc., follow the same rule.

The relation of stature to the size of head is shown in the following table:

Stature.	Number Observed.	Length of Head.	Percent of Stature	Calculated Length of Head.	Difference.
Short	356	186	11.91	178	+8
Below the average	460	187	11.50	186	+1
Above the average	420	188	11.43	191	—3
Tall	292	190	10.95	198	—8
Total	1,528	188	11.43	—	—

It will be observed from these figures that with the increase of stature the size of the head does not increase proportionally, although it increases absolutely. Thus, while the length of the head of the tall persons was 4 mm. longer than that of the short persons, in the former it was 10.95 percent of the body height, as against 11.91 percent in the latter. If we take the average length of the head as a standard, and consider that the normal length of the Jew's head is 11.43 percent of his stature, we should expect that the short people should have heads 178 mm. long; but empirically we find that it is 8 mm. larger than expected — 186. On the other hand, the tall persons, on the same basis, would be expected to have a length of head of 198 mm., but empirically it is seen to be 8 mm. shorter — 190 mm. All this again shows that with increase of stature the various parts of the body increase also, but only absolutely, and that relatively to the body height it decreases.

The Length of the Head of the Women

The average length of the head of the 435 Jewesses was 179 mm. — 9 mm. shorter than that of the Jews, or 95.21 percent of the length of the head found in men. When it is considered in connection with the shorter stature of the women, it is seen

that their heads are not at all smaller than those of the men. In men it was found that the length of the head amounts to 11.43 percent of the body-height, and in the women it is seen to be 11 percent — almost the same. The longest head encountered among the women was 199 mm., the shortest 159 mm., a difference of 40 mm., or 22.34 percent of the average, and larger than that found for the men. The standard deviation is 6.085 mm. and the probable error 0.193 mm., both about the same as in the men.

The seriation shown in Table XVIII, and its graphic repre-

TABLE XVIII

LENGTH OF HEAD OF 435 JEWESSES

Length of the Head (in mm.).	Number.	Percent.	Length of the Head (in mm.).	Number.	Percent.
159–160	2	0.46	181–182	59	13.57
161–162	—	—	183–184	41	9.43
163–164	3	0.69	185–186	36	8.28
165–166	7	1.61	187–188	17	3.91
167–168	7	1.61	189–190	8	1.84
169–170	13	2.99	191–192	10	2.29
171–172	27	6.21	193–194	3	0.69
173–174	26	5.95	195–196	1	0.23
175–176	54	12.39	197–198	—	—
177–178	56	12.88	199–200	1	0.23
179–180	64	14.71	Total.	435	99.97

sentation in diagram 4, show nothing of significance, excepting that the curve is smooth and its apex occurs at 179–180 mm., the median length, where 14.71 percent of all the observations are found.

From Table XIX is seen that the average length of the head of the immigrant Jewesses is greater than that of Jewesses who remained at home. Excepting those from Galicia, who measured exactly the same as the Jewesses measured by Majer and Kopernicki in Galicia, the Polish Jewesses averaged 181 mm., as against only 177 mm. in Warsaw; the Little-Russian Jewesses were found to have an average length of head of 180 mm. in New York City, and only 177 in their native land (Talko-Hryncewicz). This corresponds to the facts observed while considering the same measurement in men.

TABLE XIX

LENGTH OF HEAD OF 435 JEWESSES ACCORDING TO NATIVITY

Length of the Head (in mm.).	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.
159–160	—	1.79	—	1.35	—	—
161–162	—	—	—	—	—	—
163–164	1.64	—	1.00	—	—	—
165–166	2.46	—	1.00	2.70	—	—
167–168	3.28	—	2.00	—	—	2.56
169–170	1.64	3.57	2.00	1.35	6.82	7.69
171–172	8.20	3.57	6.00	1.35	4.55	15.38
173–174	6.56	7.14	5.00	6.76	—	10.26
175–176	11.48	8.93	12.00	13.51	22.73	7.69
177–178	18.03	14.29	9.00	9.46	15.91	7.69
179–180	15.57	14.29	16.00	13.51	15.91	10.26
181–182	9.00	10.71	20.00	20.27	6.82	10.26
183–184	7.38	12.50	7.00	10.81	9.09	15.38
185–186	6.56	10.71	8.00	9.46	13.64	2.56
187–188	2.46	5.36	6.00	5.41	—	2.56
189–190	2.46	1.79	1.00	—	2.27	5.13
191–192	3.28	3.57	2.00	1.35	—	2.56
193–194	—	1.79	1.00	1.35	—	—
195–196	—	—	1.00	—	—	—
197–198	—	—	—	—	2.27	—
199–200	—	—	—	1.35	—	—
No. observed.	122	56	100	74	44	39
Average.	178	181	179	180	179	178
Maximum.	192	193	196	199	197	191
Minimum.	163	160	163	160	169	167

The rule observed in men that the antero-posterior diameter of the head of the Jews depends on that of the non-Jewish races in the same country is not evident among the Jewesses.

WIDTH OF THE HEAD

The width of the head was obtained by searching with the points of the calipers along the temples, over the ears and somewhat posteriorly. The average for the 1,528 men was 154.4 mm. — 9.37 percent of the body-height. The maximum was 174 mm., and the minimum 130 mm., a difference of 44 mm., or 28.57 percent of the average, which is larger than that observed for the length of the head — 20.74 percent. This is due to the fact that the individual with a head of 130 mm. in width was quite an exception. He was an Hungarian by birth and his head measured 198 mm. in length, thus giving a ce-

phalic index of 65.66. He presented many signs of rickets in early life. Excluding this individual, we find that the extreme individual variation extends over 39 mm. (135 the maximum, and 174 the minimum), or 25.32 of the average, which is also larger than that found for the length of the head. This tends to indicate that the width of the head is not as stable a trait as is sometimes considered, and that its length is more valuable as a measure of somatic characteristic. The standard deviation was 5.482, and the probable error 0.9443.

The seriation of the width of the head is given in the accompanying Table XX, and in diagram 5 a curve is drawn from these figures. This curve appears smooth, pointing at 154 mm., which corresponds to the general average width. Over 80 per cent of all observations have had heads from 147 to 160 mm. wide, a variation of only 13 mm.

TABLE XX

WIDTH OF HEAD OF 1,528 JEWS

Width of the Head (in mm.).	Number.	Percent.	Width of the Head (in mm.).	Number.	Percent.
129–130	1	0.07	153–154	234	15.32
131–132	—	—	155–156	231	15.12
133–134	—	—	157–158	192	12.56
135–136	1	0.07	159–160	131	8.57
137–138	3	0.21	161–162	65	4.25
139–140	8	0.52	163–164	55	3.60
141–142	16	1.04	165–166	28	1.83
143–144	33	2.16	167–168	4	0.26
145–146	64	4.19	169–170	2	0.13
147–148	96	6.28	171–172	2	0.13
149–150	155	10.14	173–174	2	0.13
151–152	205	13.41	Total.	1,528	99.99

Taller men have relatively narrower heads than shorter men, as can be seen from the following table:

Stature.	Number Observed.	Width of Head.	Percent of Stature.	Calculated Width of Head.	Difference.
Short.....	356	153	9.80	146	+7
Below the average.....	460	154	9.37	152	+2
Above the average.	420	154	9.37	156	—2
Tall.....	292	156	8.99	162	—6
	1,528	154	9.37	—	—

It is seen that while the absolute width of the head of the tall persons was on the average three mm. larger than that of the short people, they were nevertheless relatively narrower. The heads of the latter were on the average 9.8 percent of their

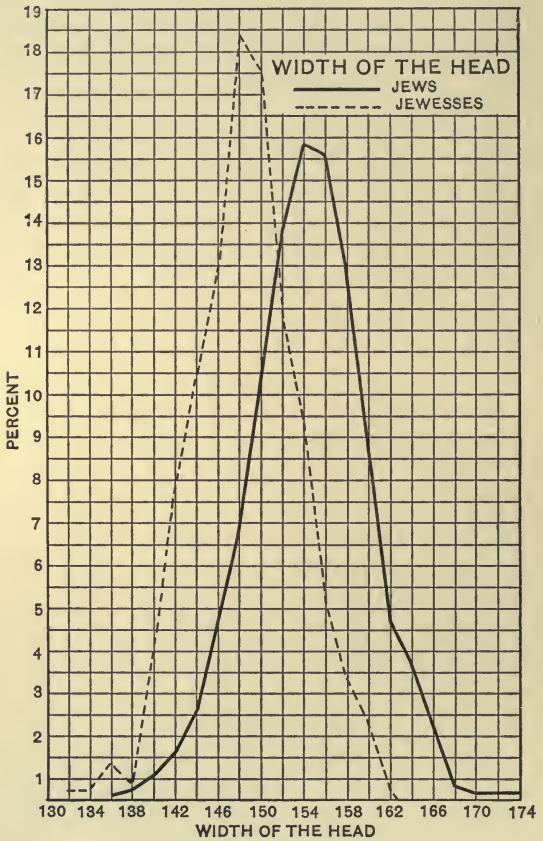

FIG. 5.—Relative width of head of Jews and Jewesses.

body height, while in the former the percentage was only 8.99, being 6 mm. shorter than the average length, while the short persons had heads 7 mm. wider than the average width would indicate.

The average width of the head of the Jews according to their

nativity is about the same in each group, ranging from 153 mm. in the Roumanian Jews, 154 in the Polish and Lithuanian Jews, to 155 mm. in all the other groups. When compared with Jews who were measured in eastern Europe, the immigrants have somewhat wider heads, but the differences are very small, from one to three mm. There is no evidence in these figures of a correspondence of the width of the head of the Jews with that of the Gentiles of the country of their birth. In Galicia the width of the head of the Poles was found to be 152 mm. and of the Ruthenians 153 mm., that of the Jews is 155 mm.; in Russian Poland Elkind found the average width of the head of the Poles in Warsaw to average 150 mm., and that of the Jews 154 mm.; the Letto-Lithuanians and the White Rus-

TABLE XXI

WIDTH OF HEAD OF 1,528 JEWS ACCORDING TO NATIVITY

Length of Head (in mm.).	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.	United States.
120–130	—	—	—	—	—	0.71	—
131–132	—	—	—	—	—	—	—
133–134	—	—	—	—	—	—	—
135–136	—	—	—	—	—	—	0.80
137–138	0.32	—	0.36	0.45	—	—	—
139–140	0.32	0.63	0.73	0.45	—	0.71	0.80
141–142	0.65	2.22	1.82	0.45	—	—	0.80
143–144	2.63	2.22	4.36	0.91	2.00	—	0.80
145–146	7.87	2.22	4.73	3.20	4.00	3.57	1.61
147–148	5.90	3.17	9.09	10.05	2.00	7.14	6.45
149–150	7.87	12.70	9.82	6.85	16.00	8.57	11.29
151–152	15.41	13.33	9.82	15.98	12.67	12.86	13.72
153–154	14.10	13.96	17.09	14.16	16.67	12.14	21.78
155–156	13.12	17.46	16.37	13.70	14.67	17.86	11.29
157–158	11.15	11.75	13.82	13.70	13.33	15.71	9.68
159–160	8.20	10.79	4.00	8.67	8.67	7.86	14.51
161–162	4.92	4.44	2.54	4.57	7.33	4.30	1.61
163–164	3.61	2.54	3.64	4.57	2.00	5.00	4.84
165–166	2.95	1.90	1.09	1.82	—	2.86	—
167–168	0.32	—	0.73	—	—	0.71	—
169–170	—	0.32	—	0.45	—	—	—
171–172	0.32	0.32	—	—	—	—	—
173–174	0.32	—	—	—	0.67	—	—
No. observed.	305	315	275	219	150	140	124
Average.	155	154	154	155	153	155	154
Maximum.	173	171	168	170	174	168	164
Minimum.	138	139	138	138	143	130	135

sians have an average width of 151 mm. (Talko-Hryncewicz), and the Jews from that country 154 mm.; in Little Russia the indigenous population, according to Talko-Hryncewicz, have an average width of head of 153 mm., and the Jews from that country average 155 mm.; finally, the Roumanians measure 154 on the average (Pittard) and the Jews 153 mm. There is thus not evident any relation between the measurement of the width of the head of the Jews and that of the indigenous races of eastern Europe among which they have lived. The differences are almost insignificant, being less than the chances of error would lead one to expect. There is however a striking similarity in the average values as a whole. The fluctuations in these values among the Gentile races is from 152 to 154 mm., and among the Jews from 153 to 155 mm. — practically the same. It cannot be expected that any influence one group may have had on the other shall be evident from a study of the width of the head, because the values are practically uniform in magnitude.

Width of the Head of the Women.

The width of the head of the women was 149 mm. on the average, or 9.77 percent of their average stature. The maximum width was 165, and the minimum, 131 mm., a difference of 24 mm. or 16.1 percent of the average, which is much smaller than that of the men. The standard deviation was 5.015; the probable error 0.162, both about the same as in men, considering that the number of women measured was much smaller than

Table XXII

Width of Head of 435 Jewesses

Width of the head (in mm.).	Number.	Percent.	Width of the head (in mm.).	Number.	Percent.
131–132	1	0.23	151–152	50	11.49
133–134	1	0.23	153–154	38	8.74
135–136	4	0.92	155–156	21	4.83
137–138	2	0.46	157–158	12	2.76
139–140	16	3.68	159–159	8	1.84
141–142	32	7.35	161–162	1	0.23
143–144	43	9.89	163–164	—	—
145–146	53	12.18	165–166	1	0.23
147–148	78	17.93			
149–150	74	17.01	Total.	435	100.00

men. A glance at Table XXII and the curve in diagram 5 shows again the phenomenon observed when the length of the head was considered. The apex of the curve for the women rises much higher than that for the men — nearly 18 percent had heads 147–148 mm. wide, and 17 percent 149–150 mm. The curve in general is much narrower and is quite smooth. Of all the observations 77 percent lie within a range of 10 mm. — between 143 and 154 mm. This of course points to great uniformity of type.

TABLE XXIII

WIDTH OF HEAD OF 435 JEWESSES ACCORDING TO NATIVITY

Width of the Head (in mm.).	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.
131–132	0.82	—	—	—	—	—
133–134	—	—	1.00	—	—	—
135–136	1.64	1.79	—	1.35	—	—
137–138	0.82	—	—	1.35	—	—
139–140	2.46	—	3.00	10.81	4.55	—
141–142	7.38	8.93	9.00	8.11	—	7.69
143–144	4.92	19.64	9.00	9.46	13.64	10.26
145–146	8.20	8.93	16.00	12.16	9.09	23.08
147–148	13.93	25.00	17.00	17.57	22.73	17.95
149–150	22.95	10.71	19.00	12.16	15.91	12.82
151–152	10.66	10.71	14.00	8.11	18.18	7.69
153–154	12.30	5.36	4.00	10.81	9.09	10.26
155–156	6.56	1.79	6.00	4.05	2.27	5.13
157–158	4.92	5.36	1.00	2.70	—	—
159–160	1.64	1.79	1.00	1.35	4.55	2.56
161–162	—	—	—	—	—	2.56
163–164	—	—	—	—	—	—
165–166	0.82	—	—	—	—	—
No. observed.	122	56	100	74	44	39
Average width.	151	148	149	148	149	148
Maximum.	165	159	159	159	160	161
Minimum.	136	136	134	136	139	142

According to their nativity, the Jewesses show an almost uniform width of the head, as is seen from Table XXIII. The immigrant Jewesses have on the average wider heads than the Jewesses in eastern Europe. Thus, the Jewesses in Galicia average 143 mm. (Majer and Kopernicki) in width, while the immigrant Jewesses from that country measure 151 mm.; the Polish Jewesses in the United States average in the width of the

head 148 mm., while in Warsaw this measurement was found to be 146 mm. (Elkind); the Lithuanian and White-Russian Jewesses in New York had an average width of the head of 149 mm., and in their native country Yakowenko has found this measurement to amount to 144 mm.; and in Little Russia the average was 145 mm. (Talko-Hryncewicz) as against 148 mm. of immigrant Jewesses from that country.

Compared with the non-Jewish women in these countries in eastern Europe it is seen that there is practically no difference between the two. The Gentile women measure as follows: White Russian 145 mm. (Talko-Hryncewicz), Little Russian 148 mm., Polish 146 mm. (Elkind), Letto-Lithuanian 145 mm., Ruthenian 147 mm (Majer and Kopernicki). It is thus seen to be quite uniform, and this characteristic is shared by the Jewesses.

The Cephalic Index

The average cephalic index was obtained by multiplying the average width of the head by 100 and dividing the product by the average length, thus:

$$100 \times \frac{154}{188} = 81.91 = \text{cephalic index.}$$

The minimum was 65.66, and the maximum 94.76, showing an extreme individual variation of 29 units, or 35 percent of the average index. Excluding the individual with an index of 65.66 as pathological, there still remains a range of extreme variation of 24 units, or 29 percent of the average. It will also be observed that the deviation from the average was much larger toward the minimum — 20.73 percent of the average (65–82) — while the maximum was only 14.63 percent distant from the average. This tends to indicate a greater tendency to dolichocephaly.

The standard deviation was 3.176, and the probable error 0.05477, much smaller than that found in the case of stature and the length and width of the head. Between ± of the standard deviation, *i. e.*, between the cephalic index of 78 and 85, were 1,243 individuals — 81.34 percent of all observations were

within these limits. The significance of this is more apparent when we consider the probable error, which was only 0.054. It shows that there is an even chance that when we should obtain another series of 1,528 Jews in New York City we shall find their average cephalic index within the limits of ± of the probable error — 81.85 and 81.96. The chances are four to one that it will be within twice these limits, and nineteen to one that it will lie within thrice these limits, *i. e.*, between 81.748 and 82.072. The head-form is thus shown to have a very small range of variability, and the average determined in this series is quite close to the true or ideal average. This confirms again the conclusion that the cephalic index is a very stable racial trait.

Classifying the figures according to Deniker's scheme, we find the following distribution:

	Number.	Percent.
Hyperdolichocephalic (less than 76)	44	2.89
Dolichocephalic (76 and 77)	112	7.36
Subdolichocephalic (78 and 79)	236	15.51
Mesocephalic (80 and 81)	394	25.78
Subbrachycephalic (82 and 83)	367	24.01
Brachycephalic (84 and 85)	246	15.97
Hyperbrachycephalic (86 and more)	129	8.48
	1,528	100.00

This shows that the type of the Jewish head is mesocephalic. Fifty percent of individuals had a cephalic index varying between the limits of four units, 80 to 83 inclusive; over eighty percent varied only between the limits of eight units, 78 to 85. This of course, points to homogeneity of cranial type.

This apparent uniformity of cranial type is displayed to still better advantage when the seriation of the cephalic index is observed, in which each individual index is given with the percentage of frequency of persons who had a given index, as has been done in Table XXIV. The curve plotted to scale from these figures in diagram 6 shows this in graphic form. It will be seen that the cephalic index of 65 stands alone. It may be disregarded because it is a manifestation of rickets in the early years of its possessor. One individual had a cephalic index of 70, not one with 71. Only at 72 does the real series begin:

TABLE XXIV

CEPHALIC INDEX OF 1,528 JEWS

Cephalic Index.	Number.	Percent.	Cephalic Index.	Number.	Percent.
65	1	0.07	83	166	10.86
70	1	0.07	84	138	8.90
71	—	—	85	108	7.07
72	1	0.07	86	66	4.32
73	4	0.26	87	22	1.44
74	17	1.11	88	28	1.83
75	20	1.31	89	4	0.26
76	40	2.62	90	1	0.07
77	72	4.74	91	3	0.21
78	111	7.33	92	3	0.21
79	125	8.18	93	1	0.07
80	194	12.69	94	1	0.07
81	200	13.09			
82	201	13.15	Total.	1,528	100.00

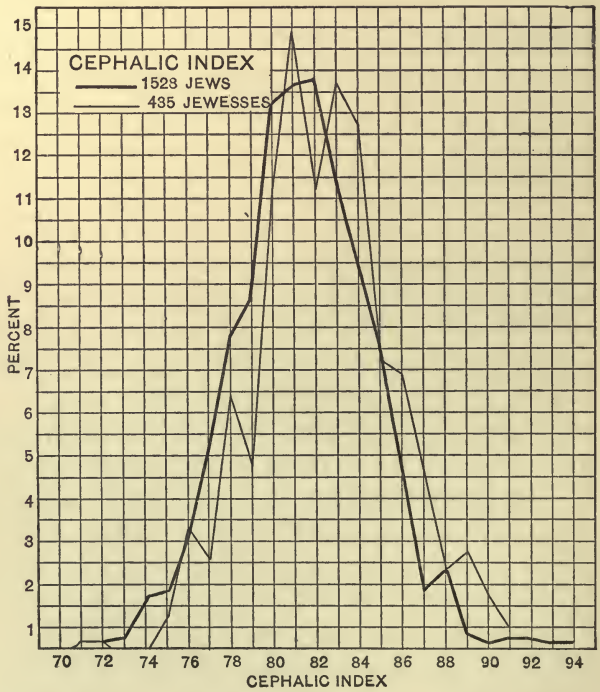

FIG 6.— Cephalic index of 1,528 Jews and 435 Jewesses.

4 persons (0.26 percent) with an index of 73, and then the curve begins to rise steadily until the index of 81 is reached. At this point the number of persons observed is over 13 percent. The curve now begins to descend steadily, with a slight rise at 88, which is of no special significance — it may be attributed to chance variation.

This curve, apparently proving uniformity of the cranial type of the Jews of eastern Europe, and having a wide range of extreme individual variation, is rather striking and peculiar. In order to test our own results it will be well to compare this material with that of other investigators. We have for this purpose obtained measurements of 1,113 Jews from the literature on the anthropology of these people in eastern Europe. Only such statistics were taken as were reported in a form suitable for comparison with our own figures. Such were found in the works of Yakowenko (139 Lithuanian Jews), Elkind (200 Polish Jews), Talko-Hryncewicz (507 Jews in Lithuania and Little Russia), Weissenberg (100 South-Russian Jews), Stieda (67 Jews in Minsk-Russia) and Blechman (100 Jews in Russia). Classifying these figures as we did our own, we find:

Cranial Type.	Jews in Europe.	Jews in U. S.	Both series combined.
Hyperdolichocephalic	1.78%	2.89%	2.42%
Dolichocephalic	4.76	7.36	6.24
Subdolichocephalic	12.58	15.51	14.23
Mesocephalic	22.73	25.78	24.50
Subbrachycephalic	25.42	24.01	24.61
Brachycephalic	18.69	15.97	17.19
Hyperbrachycephalic	14.03	8.47	10.81

From these figures it is seen again that fifty percent of all observations lie within the limits of four units, in each of the three series, and eighty percent within the limits of eight units. The seriation of these measurements as in Table XXV gives more striking results. In both series the curve is quite smooth, the slight indentations can be explained as caused by errors of observation and calculation, and are always expected to occur, no matter how careful the observer may be. The indentation at

the cephalic index of 81 in the curve for the 1,113 Jews in eastern European Jews may be explained by this or by chance variation. This is probably also the cause of the elevation of the curve for all the 2,641 Jews at the index of 80.

TABLE XXV

CEPHALIC INDEX OF 1,113 JEWS IN EASTERN EUROPE

Cephalic Index.	Number.	Percent.	Cephalic Index.	Number.	Percent.
70	1	0.09	84	112	10.06
71	—	—	85	96	8.63
72	1	0.09	86	72	6.47
73	5	0.44	87	34	3.06
74	4	0.36	88	22	1.97
75	9	0.81	89	11	1.00
76	16	1.44	90	7	0.63
77	37	3.32	91	4	0.36
78	52	4.67	92	2	0.18
79	88	7.91	93	3	0.27
80	126	11.32	94	—	—
81	127	11.41	95	1	0.09
82	155	13.92			
83	128	11.50	Total.	1,113	100.00

Before proceeding to discuss these curves as a test of the purity of race we desire to point out a peculiar feature of these two series of observations. It will be seen that the immigrant Jews in New York have 10.25 percent of persons with heads of the dolichocephalic type (cephalic index less than 78), while the Jews in eastern Europe have only 6.54 percent of such individuals. On the other hand, 32.72 percent of Jews in eastern Europe have brachycephalic heads (cephalic index 84 and more), while those who have left Europe and emigrated to the United States have only 24.45 percent of people with this cranial type. The difference is more striking when observed in diagram 7. The curve for the Jews in New York City is seen toward the left, while that for the Jews of eastern Europe is moved to the right. All this tends to show that the immigrant Jews are more long-headed than the average of the people whom they leave in their native country. Lapouge, Ammon, Ripley, and others will see in this a further proof for the theory that great cities serve, for some obscure reason, as an attraction to

long-headed humanity.[1] How far the longheadedness of the Jewish immigrants to the United States as compared with the Jews in eastern Europe is due to the same conditions which are operative in western Europe, we are not in a position to state. We

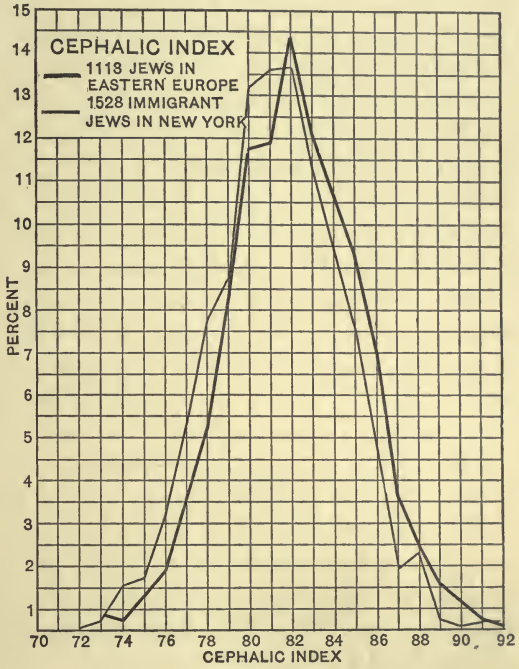

FIG. 7.—Cephalic index of eastern European and immigrant Jews.

merely note the fact, and can add that from Jacobs' observations in London the same appears to be the case with the Jews there.[2]

A combination of both series of observations, those of Elkind, Talko-Hryncewicz, Blechman, Weissenberg, etc., and those of our own, as we have done in Table XXVI, and the curve drawn from these — figures representing measurements of 2,641 Jewish

[1] See Otto Ammon, "Zur Anthropologie der Badener," pp. 431 and 614; Wm. Z. Ripley, "The Races of Europe," chapter XX.

[2] Joseph Jacobs, "On the comparative anthropometry of English Jews," *Journal Anthropological Institute*, XIX, 1890, pp. 76–88.

heads, depict yet more graphically the homogeneity of the cranial type of the eastern European Jews. This homogeneity may easily deceive us into believing it to be the best proof of the freedom of the Jews from admixture of foreign blood. This in fact was the opinion we entertained in 1902, when discussing the same problem,[1] but a close study of the anthropology of the races and peoples in eastern Europe among whom the Jews have lived for centuries has materially altered our opinion.

These Jews come from the parts of Russia known as Lithuania, White Russia, Little Russia, and Poland ; and also from Austrian Galicia, Hungary, and Roumania. A careful study of the head-form of the indigenous population of these countries reveals the following remarkable fact: their head-form is more homogeneous than that of the population of any other part of Europe. "The perfect monotony and uniformity of environment of the Russian people," says Ripley, "is most clearly expressed anthropologically in their head-form . . . a moment's consideration of our map shows at once a great similarity of headform prevailing all over Europe from the Carpathian mountains east and north. *The cephalic index oscillates but two or three points above a center of 82.* . . . Our widest variation in Russia is about five units.[2]

It is safe to assume that if any non-Jewish blood has been infused into the veins of eastern European Jews during the last thousand years, it must have come from exactly the races and peoples inhabiting just this region of Europe. A close examination of the map ingeniously prepared by Ripley[3] shows graphically that the cephalic index of these peoples is about the same as that of the Jews we are considering. Any slight differences that occur in some places are also to be observed in the Jews from these countries. Wherever there is an increase in the width of the head of the native races, as for instance in Galicia, the same is to be observed in the Jews coming from these countries. Howsoever so small it may be, the difference is still

[1] See "Physical Anthropology of the Jews," I, Cephalic Index, *American Anthropologist*, N. S., IV, pp. 684–706.

[2] Wm. Z. Ripley, "The Races of Europe," pp. 341–342.

[3] *Ibid.*, p. 340.

determinable by means of the calipers when measurements are taken on the Jews.

The cephalic index is considered by many anthropologists a primary test of race. At the present state of our knowledge we are not aware that it is influenced by any external conditions and environment. Neither climate, nor altitude, nor any artificial or social selection or social or economic conditions are known to have any effect on the shape of the head. Wherever any differences in headform have been found, anthropologists have always looked for their cause in the intermixture of races. But can we accept uniformity of cranial type, even such striking uniformity as is displayed by the eastern European Jews when studied *en masse*, as a proof of their racial purity and the absence of non-Jewish blood in their veins?

In order that we may answer this question intelligently, we have collected measurements taken by European observers on the various Slav races inhabiting the countries in which these Jews have lived for nearly a thousand years. For Poland, Elkind's work has been used; Talko-Hryncewicz's works have been drawn on for data on the Letto-Lithuanians, Little Russians, and White Russians; for the Roumanians Pittard's recent study of this people has been employed. We have thus collected measurements of 2,906 non-Jewish inhabitants of eastern Europe, and have compared them with the Jews under consideration.

A glance at Table XXVI and the accompanying diagram 8 reveals the following remarkable features: The course of both curves is about the same, excepting that the curve representing the Jews appears to tend toward a display of more dolichocephalic heads, being more toward the left. The curve for the Slavs shows a small elevation at the index of 80 and an indentation at 81. That this is not an indication of any particular racial element can be concluded by considering the fact that the interval between the two apices is only one unit — 81; and the difference between the proportion of the indices is very small. There appears to have been a few more individuals with an index of 80 than might be expected theoretically, and a few less with the

TABLE XXVI

CEPHALIC INDEX OF JEWS AND NON-JEWS IN EASTERN EUROPE

Cephalic Index.	Jews.		Non-Jews.		Jews and Non-Jews.	
	Number.	Percent.	Number.	Percent.	Number.	Percent.
65	1	0.04	—	—	1	0.04
70	2	0.07	—	—	2	0.03
71	—	—	7	0.24	7	0.11
72	2	0.07	2	0.07	4	0.07
73	9	0.36	9	0.31	18	0.32
74	21	0.79	20	0.68	41	0.74
75	29	1.09	27	0.93	56	1.01
76	56	2.12	64	2.20	120	2.16
77	109	4.12	100	3.44	209	3.76
78	163	6.17	161	5.54	324	5.84
79	213	8.06	193	6.64	406	7.31
80	320	12.12	313	10.77	633	11.59
81	327	12.38	249	8.57	576	10.39
82	356	13.48	334	11.49	690	12.43
83	294	11.13	335	11.53	629	11.33
84	250	9.46	306	10.53	556	10.02
85	204	7.73	246	8.47	450	8.11
86	138	5.22	193	6.64	331	5.96
87	56	2.12	134	4.61	190	3.44
88	50	1.89	86	2.96	136	2.47
89	15	0.57	61	2.10	76	1.26
90	8	0.31	33	1.14	41	0.74
91	7	0.27	15	0.52	22	0.39
92	5	0.19	6	0.21	11	0.19
93	4	0.16	4	0.13	8	0.14
94	1	0.04	5	0.17	6	0.10
95	1	0.04	3	0.10	4	0.07
Total.	2,641	100.00	2,906	99.99	5,547	100.00

index 81. The same holds good for the curve representing both Jews and Slavs in diagram 8. Here the curve runs quite a smooth course. The apex corresponds to the average index, and at both sides of the apex the curve descends steadily — the proportion of persons with given indices decreases regularly the farther we get away from the average cephalic index. The largest proportion of persons had an index of 82 — the average cephalic index — and on both sides of this apex the curve runs steadily down. There appears to be a symmetrical and harmonious arrangement of the curve on both sides. In fact there are all the evidences to lead us to believe that we deal here with a single, homogeneous, and pure race. But, as we

know, there is here represented more than half a dozen races, each of which taken by itself can not be considered free from foreign elements to any extent.

The head-form of the eastern European Jews, when studied *en masse*, is consequently not a safe criterion of their racial purity. Even if they had intermarried, clandestinely or otherwise, in past centuries or in modern times, with their Slavic neighbors

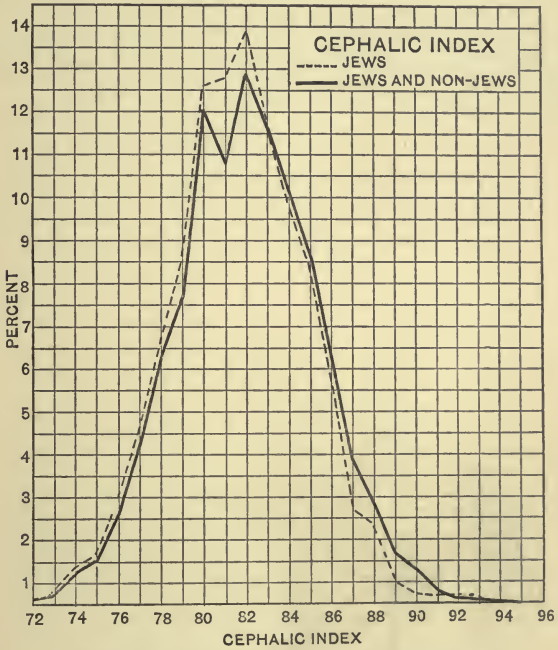

FIG. 8.— Cephalic index of Jews and non-Jews.

in eastern Europe, we could not expect that the foreign blood thus infused would be evident in the study of their cranial type. The differences, if any are to be discerned, are too small to be felt by the calipers and tape to have an extent as to show any characteristics in the cephalic index.

It may therefore be presumed that the only method which promises to give more or less satisfactory results is the application of the comparative study of the head-form of the Jews with

that of the races among which they have lived for a longer time in given localities. If we find that the shape of the head is the same in every country, notwithstanding the differences displayed in this regard by the non-Jewish races in these localities, then of course we may see in this a good argument in favor of the purity of the race and the absence of any serious intermixture of foreign blood. But if, on the other hand, we find that wherever the head of the non-Jewish population is broader or longer, the Jews also display this characteristic; then the only cause to be assigned for this phenomenon is, in the present state of our knowledge, the admixture of foreign racial elements.

TABLE XXVII

CEPHALIC INDEX OF 1,528 JEWS ACCORDING TO THEIR NATIVITY

Cephalic Index.	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.	United States.
65	—	—	—	—	—	0.71	—
68	—	—	—	0.45	—	—	—
70	—	0.32	—	—	—	—	—
71	—	—	—	—	—	—	—
72	—	0.32	—	—	—	—	—
73	0.32	0.63	0.36	—	—	—	—
74	0.32	1.59	1.45	1.37	—	0.71	2.42
75	0.98	0.95	3.28	1.37	—	0.71	0.80
76	0.98	3.49	4.36	2.74	1.33	2.14	2.42
77	3.93	4.78	8.00	2.28	2.67	1.43	9.68
78	4.26	5.08	10.91	7.77	6.67	5.00	14.51
79	4.92	8.89	10.91	8.67	7.33	7.14	9.68
80	14.10	13.33	14.91	10.05	13.33	11.43	7.26
81	13.77	9.21	12.36	14.61	15.33	12.86	18.55
82	14.43	14.92	9.45	19.63	9.33	10.72	9.68
83	12.46	11.75	8.00	9.60	10.00	17.85	5.65
84	8.20	10.47	8.73	7.31	9.33	11.43	8.07
85	8.20	7.30	2.54	6.40	12.00	9.29	6.45
86	5.25	2.86	3.28	5.93	6.00	3.57	4.03
87	2.63	0.95	0.73	1.37	3.33	—	0.80
88	3.93	1.90	0.73	0.45	2.00	2.86	—
89	0.32	0.32	—	—	0.67	0.71	—
90	—	0.32	—	—	—	—	—
91	—	—	—	—	0.67	1.43	—
92	0.98	—	—	—	—	—	—
93	—	0.32	—	—	—	—	—
94	—	0.32	—	—	—	—	—
Number.	305	315	275	219	150	140	124
Average.	83.33	81.91	81.05	82.45	81.82	82.45	81.05
Maximum.	92.51	94.76	88.24	90.18	91.32	91.88	87.53
Minimum.	73.63	70.52	73.74	75.42	76.14	65.66	74.69

In Table XXVII the cephalic index of the Jews according to their nativity is presented. The differences in the averages are very slight: the Galician Jews have an average cephalic index of 83.33, while the Lithuanian and Amerian Jews have only 81.05, the other groups, about 82. When compared with the Jews in eastern Europe, we find that the headform is about the same as in the immigrants, with one slight exception to be noted when they are compared in groups representing the various types of headform. This has been done in Table XXVIII for the Polish, Lithuanian, and Little Russian Jews. For the rest there is no available literature, the present being the first measurements of Roumanian and Hungarian Jews that have been reported.

TABLE XXVIII[1]

CEPHALIC INDEX OF IMMIGRANT AND EASTERN EUROPEAN JEWS

Type of Head.	Poland.		Lithuania.		Little Russia.	
	N. Y.	Poland.	N. Y.	Lithuania.	N. Y.	Little Russia.
-75	3.81	1.5	5.09	2.55	3.19	1.30
76-77	8.27	5.5	12.36	8.00	5.02	3.72
78-79	13.97	17.5	21.82	14.55	16.44	10.04
80-81	22.56	26.5	27.27	28.00	24.66	18.77
82-83	26.67	29.5	17.45	26.55	29.23	22.86
84-85	17.77	15.0	11.27	11.63	13.71	24.16
86 +	6.67	4.5	4.74	8.72	7.75	19.15

A comparison of the immigrant Jews from Galicia with those in their native country (from Majer and Kopernicki's measurements) is here given:

Cephalic Index.	New York.	Galicia.
-74	0.64	3.63
75-77	5.89	3.87
78-80	23.28	13.80
81-84	48.87	49.40
85 +	21.32	29.30

From these tables we see that the proportion of dolichocephalic individuals, with a cephalic index of less than 78, is larger in the

[1] The figures for the eastern European Jews have been taken from the works of the following authors: Elkind, for the Polish Jews; Stieda, Talko-Hryncewicz, and Yakowenko, for the Lithuanian and White Russian Jews; Weissenberg and Talko-Hryncewicz for the Little Russian and South Russian Jews.

immigrant Jews than among those in their native countries, while the proportion of brachycephalic individuals (cephalic index 84 and more) is larger among the stay-at-homes than among the immigrants. There are only two exceptions — Galician Jews have 7.5 percent of dolichocephalic in Galicia, while those who emigrated to the United States have only 6.53 percent of persons with this type of head; and the Polish Jews have 24.44 percent of brachycephalic among the immigrants, as against 19.5 percent among those left at home. All the rest follow the rule that immigrants have a larger percentage of the dolichocephalic than the brachycephalic type of head. In the Galician Jews this possibly goes hand-in-hand with the absence of social selection which has been evident when stature was considered.

A comparison of the headform of the Jews with the indigenous population of the countries in which they have lived is

TABLE XXIX

CEPHALIC INDEX OF JEWS AND OF NON-JEWISH EASTERN EUROPEAN RACES

Country.	Number Observed.	Average Cephalic Index.	75 and Less.	76 and 77.	78 and 79.	80 and 81	82 and 83.	84 and 85.	86 and more.	Observer.
Poland.										
Jews.	515	81.75	2.19	7.19	15.35	24.27	27.75	16.70	5.83	Elkind, Fishberg.
Poles.	226	80.85	2.65	17.25	22.57	20.36	23.45	7.97	5.75	Elkind.
Lithuania and *White Russia.*										
Jews.	550	81.10	3.82	10.18	18.18	27.64	22.0	11.45	6.74	Yakowenko, Stieda, Tal.
Letts.	476	80.60	2.52	6.30	13.86	21.85	23.95	19.76	11.76	Talko-Hryncewicz.
White Russ.	961	83.20	2.81	5.83	13.22	20.09	22.58	18.52	16.96	Talko-Hryncewicz.
Little Russia.										
Jews.	757	82.45	1.85	4.09	11.89	20.49	24.70	21.12	15.86	Talko, Weissenberg.
Little Russ.	1055	83.20	1.23	2.56	7.96	17.54	23.52	21.61	25.59	Talko-Hryncewicz.
Roumania.										
Jews.	150	81.82	1.33	9.33	20.67	24.67	19.33	18.0	6.67	Fishberg.
Roumanians.	190	82.92	3.7	6.3	13.7	17.89	19.47	17.89	21.05	Pittard.

given in Table XXIX, which shows some noteworthy characteristics.[1]

CEPHALIC INDEX OF JEWS, POLES, AND RUTHENIANS IN GALICIA

Type of headform.	Jews.	Poles.	Ruthenians.
-74	2.37	1.49	3.33
75-77	4.73	3.62	4.82
78-80	17.82	11.41	15.86
81-84	49.17	34.60	37.25
85 +	25.91	48.88	38-74

From these tables it is seen that the headform of the Jews, when compared with the indigenous races of the countries whence they come, shows great similarity. In Galicia, where the cephalic index of the Ruthenians is 83.5 and that of the Poles is 84.4, that of the Jews is 83.33; in Russian Poland, where the cephalic index of the Poles is only 80.85 (Elkind), the Jews also are more long-headed, having an average cephalic index of 81.75; the same is the case in Lithuania and White Russia, where the Letts are long-headed, with a cephalic index of 80.5 (Waeber), and even 78.5 according to Talko-Hryncewicz's measurements, as are also the Lithuanians, averaging 78.75 (Talko-Hryncewicz, Brennsohn). Here the Jews have an average cephalic index of 81.10.[2] Southern Russia, where the Little Russians predominate in numbers, is another center of brachycephaly, their cephalic index being over 83 on the average, and even 85.61 according to Belodied.[3] The Jews in this region of Russia have an average index of 82.45. In Roumania very few measurements have been taken on the indigenous population. From Pittard's recent work the Roumanians are seen

[1] The measurements of the non-Jewish races in this table are taken from the following works: For the Poles, Elkind, "The Wisla Poles," *Mem. Royal Soc. of Friends of Natural Science, Anthrop. and Ethnography*, Vol. 90, Moscow, 1896; Lithuanians and White Russians, Talko-Hryncewicz, "Charakterystyka fizyczna ludosci Litwy i Rusi," *Zbior Wiadom. do antropol. krajowej*, Vol. XVII, Krakow, 1893; Little Russians, *idem.*, "Charakterystyka fizyczna ludu ukrainskiego," *ibid.*, Vol. XIV, Krakow, 1890; Roumanians, Pittard, *loc. cit.*; Galicia, Majer and Kopernicki, *loc. cit.*

[2] The White Russians here are more broadheaded, 83.2 (Talko-Hryncewicz).

[3] Quoted from Ivanowski, *loc. cit.*

to have a cephalic index of 82.92.[1] The immigrant Jews from that country had an index of 82.82, nearly the same as that found by Pittard in the indigenous population; the difference in one unit may possibly be accounted for by the fact that the measurements on Jews were taken on immigrants who, as we have seen, are as a rule slightly more dolichocephalic. For the Jewish and non-Jewish population in Hungary the data are scanty. Steinberg found 54 *Szeklers* in Transylvania to be mesocephalic (cephalic index 81.4), while 69 Magyars were hyperbrachycephalic (cephalic index 87.8),[2] and Janko's measurements of 84 *Szeklers* gave an average index of 84.5. It will be seen that with such scanty and contradicting material it is impossible to draw conclusions. The Jews from that country had an average cephalic index of 82.45.

Considering that the cephalic index of the races in eastern Europe is almost uniformly confined within the limits of four units, 80 to 84, within the limits of personal error of observation and calculation of the observer, it must be agreed that the headform of the Jews agrees closely with that of the non-Jewish races and peoples of that part of Europe. This is confirmed by a close study of the figures presented in Table XXIX, showing the distribution of the classes of headform in Jews and non-Jews in various eastern European countries where materials suitable for comparison are available. Thus long-headed individuals, with a cephalic index of less than 78, are found among the Jews in the following order: 5.98 percent in Little Russia, 7.1 percent in Galicia, 9.38 percent in Poland, 10.66 in Roumania, and 14 percent in Lithuania and White Russia. Among the indigenous races in these countries the order is as follows: 3.79 percent among the Little Russians, 5.11 among the Poles in Galicia (8.15 among the Ruthenians in that country), 8.80 among the Letto-Lithuanians and White Russians, 10 percent among the Roumanians, and 19.9 among the Russian Poles.

[1] Bassanovitch finds an average index of 77.5 in 106 Roumanian immigrants in Bulgaria; Himmel, 86.3 in 200 Roumanian soldiers in Bukowina, and Weisbach found them to be hyperbrachycephalic, 26 individuals in Transylvania averaging 87.2.

[2] Quoted from Weisbach, *Körpermessungen*, etc., pp. 201 and 227.

It is thus seen that with only one exception, the Russian Poles, the order is the same among the Jews and non-Jews. Brachycephaly (cephalic index 84 and more) is among the Jews in the following order: Lithuania and White Russia, 18.19 percent; Poland, 22.53; Roumania, 24.67; Galicia, 25.91, and Little Russia, 36.98. Among the non-Jews in these countries the order is as follows: Russian Poles, 13.72 percent; Letto-Lithuanians, 21.52; White Russians, 25.48; Roumanians, 38.94; Galician-Ruthenians, 38.74; Poles, 48.88, and finally Little Russians, 47.1 percent. Here again we find that with the exception of the Polish Jews, the proportion of brachycephaly among the Jews depends on the proportion of Gentiles with this type of head among whom they live.

Cephalic Index of the Women

The average cephalic index of the 435 women was 83.24 — a little wider than that of the men. The maximum was 91.17 and the minimum, 71.47 — a difference of 20 units, or 24.09 percent of the average, thus showing a smaller range of extreme individual variation. The maximum diverged from the average by 8 units, or 9.63 percent; and the minimum 12 units, 14.45 percent, showing the same tendency of more pronounced variability toward dolichocephaly that was noted in the men. The standard deviation was 3.419, and the probable error 0.110618, about the same as in men.[1] Arranging the data in classes as was done in the case of the men, we find the following distribution:

	Number.	Percent.
Hyperdolichocephalic	5	1.15
Dolichocephalic	21	4.83
Subdolichocephalic	45	10.34
Mesocephalic	110	25.20
Subbrachycephalic	103	23.68
Brachycephalic	82	18.86
Hyperbrachycephalic	69	15.86
Total	435	100.00

[1] The larger value of the probable error being due to the fact that the number of women was smaller.

These figures show that the women display a greater tendency to brachycephaly, as is also seen by their average cephalic index. Of the Jewesses 5.98 percent had a cephalic index of less than 78, while in Jews it reached 10.25 percent. Of brachycephalic heads, with an index of 84 and above, on the other hand, 34.72 percent are found in the women as against only 24.45 percent in the men. The proportion of mesocephalic heads is about the same in both sexes.

The seriation in Table XXX and the curve plotted in diagram 6 show the maximum frequency of occurrence (14.48 percent of all the women measured) to be at the cephalic index of 81. Of women with an index of 82 only 10.57 percent were found, while indices of 83 and 84 are again well represented — 13.1 and 12.18 percent respectively. A double apex is thus produced in the curve, one culminating at the index of 81

TABLE XXX

CEPHALIC INDEX OF 435 JEWESSES

Cephalic Index.	Number.	Percent.	Cephalic Index.	Number.	Percent.
71	1	0.23	82	46	10.57
72	1	0.23	83	57	13.10
73	—	—	84	53	12.18
74	—	—	85	29	6.67
75	3	0.69	86	28	6.44
76	12	2.75	87	15	3.45
77	9	2.07	88	8	1.84
78	26	5.98	89	10	2.29
79	19	4.37	90	6	1.38
80	47	10.80	91	2	0.46
81	63	14.48	Total.	435	99.99

and the other at 83–84, with a depression at the index of 82. This double apex is of significance, showing greater variability in the headform of the women as compared with that of men. This phenomenon has been observed in our preliminary communication, where a lesser number of observations are reported. It is also to be noted in the anthropological literature of the Jews where measurements of heads of women are recorded. From Elkind's measurements of Polish Jewesses it will be seen

that the curve for the cephalic index has two apices, one at the index of 82, and the other at 84.[1] Yakowenko's measurements of Jewesses in White Russia also show a double apex in the curve for the cephalic index, one culminating at 77 and the other at 81.[2] In Talko-Hryncewicz's series of 206 Jewesses in Little Russia there are seen even three apices in the curve for the cephalic index, at 80, 82, and 85.[3] The irregularity in the curves of the headform of the Jewesses is very remarkable from a biological standpoint. Throughout the animal kingdom the males are always known to show wider limits of variation in mental and physical characters than the females. Darwin[4] has brought together many examples to this effect, both in man and in the lower animals; and Havelock Ellis[5] also shows that there is a greater tendency in man to diverge from the type than in woman. With the Jews, however, the reverse of this rule, so far as the headform is concerned, seems to apply, since it is the women who show the greater variability and differentiation.

In order to test this point we collected the measurements reported in the works of the following authors, and constructed a curve: From Weissenberg[6] 50 Jewesses in southern Russia; 125 Polish Jewesses from Elkind's work;[7] 206 Jewesses in Little Russia by Talko-Hryncewicz;[8] 100 women from Yakowenko's work;[9] all these were added to the 435 Jewesses here recorded, and thus a total of 916 women was obtained, a number which may be relied on to give definite results. In Table XXXI and diagram 9 are given the seriation and the curve

[1] A. D. Elkind, "The Jews," *Memoirs of the Soc. of Friends of Natural Science, Anthropol. and Ethnography*, Moscow, 1902, p. 132 (in Russian).

[2] M. G. Yakowenko, "Materials for the Anthropology of the Jews," St. Petersburg, 1898, p. 185 (in Russian).

[3] J. Talko-Hryncewicz, "Charakterystyka fizyczna ludnosci zydowskiej,' *Zbior wiadomosci do antropol. kraj., Krakow*, XVI, 1892, p. 45.

[4] "Descent of Man," chap. VII: "Variation of Animals and Plants under Domestication," Vol. II, chap. XIV.

[5] "Man and Woman," London, 1893, chap. XVI.

[6] "Die südrussischen Juden," *Archiv f. Anthropol.*, XXIII.

[7] *Loc. cit.*

[8] *Loc. cit.*

[9] *Loc. cit.*

TABLE XXXI

CEPHALIC INDEX OF 916 JEWESSES

Cephalic Index.	Number.	Percent.	Cephalic Index.	Number.	Percent.
68	1	0.11	83	104	11.36
71	3	0.33	84	115	12.56
72	4	0.44	85	68	7.42
73	—	—	86	53	5.79
74	2	0.22	87	29	3.16
75	8	0.87	88	20	2.18
76	21	2.29	89	17	1.85
77	27	2.95	90	14	1.53
78	51	5.57	91	5	0.54
79	52	5.67	92	—	—
80	109	11.90	93	1	0.11
81	107	11.68			
82	105	11.46	Total.	916	100.00

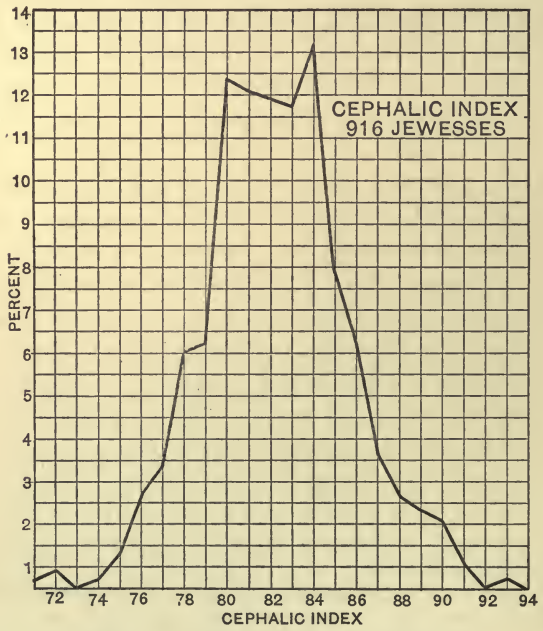

FIG. 9.—Cephalic index of 916 Jewesses.

of these figures, which again show that the variability of the Jewesses as regards their headform is much greater than that of the Jews. Here we have some evidence of two apices, one

at the index of 80 and the other at 84, both of which are connected by a more or less straight line: there is practically no depression between the two apices. In fact it may be considered that this curve has no culminating apex at all. Individuals with indices of 80 to 84 are encountered in about equal proportions, as can be seen from the flattening of the curve at its top. Whether the disturbing element in this case is some particular racial element will not be discussed now. It must be pointed out, however, that the same phenomenon is to be observed in the curve of the cephalic index of the men, although only to a lesser degree. There the flattening of the top of the curve extends only over three units, from 80 to 82, while in the curve of the women it extends over five units, from 80 to 84. The variability of the headform of the women is thus shown to be

TABLE XXXII

CEPHALIC INDEX OF 435 JEWESSES ACCORDING TO NATIVITY

Cephalic Index.	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.
71	0.82	—	—	—	—	—
72	—	—	1.00	—	—	—
73	—	—	—	—	—	—
74	—	—	—	—	—	—
75	—	—	1.00	1.35	2.27	—
76	0.82	8.93	4.00	2.70	—	—
77	1.64	1.79	4.00	2.70	—	—
78	5.74	3.57	3.00	10.81	2.27	12.82
79	4.92	5.36	3.00	2.70	6.82	5.13
80	5.74	19.64	13.00	13.51	9.09	5.13
81	9.99	19.64	12.00	22.97	18.18	7.69
82	8.20	12.50	12.00	14.86	9.09	5.13
83	14.75	5.36	20.00	8.11	6.82	17.95
84	11.47	8.93	10.00	6.76	25.00	20.51
85	10.66	5.36	3.00	5.41	9.09	5.13
86	9.99	1.79	7.00	4.05	6.82	5.13
87	5.74	1.79	5.00	1.35	2.27	—
88	4.09	—	1.00	—	—	5.13
89	2.46	1.79	1.00	1.35	—	10.26
90	2.46	1.79	—	1.35	2.27	—
91	0.82	1.79	—	—	—	—
No. observed.	122	56	100	74	44	39
Average.	84.83	81.77	83.24	82.22	83.24	83.15
Maximum.	91.81	91.87	88.41	88.73	90.19	89.92
Minimum.	71.58	76.40	72.38	74.39	75.84	78.72

greater than that of the men. It must be recalled in this connection, however, that the standard deviation, which many biologists consider the best measure of variability of physical characteristics, is about the same in men (3.176) as in women (3.419). But even this tends to contradict the accepted opinion that the male is more apt to show wider limits of variation, and confirms Pearson's theory that when studied by modern mathematical methods, available data tend to show that any difference in the degree of variability in the sexes which may be discerned, is favorable to women.[1]

In Table XXXII are given the individual variations of the cephalic index of 435 Jewesses according to their nativity. Owing to the small number of observations in each group, it can not be expected that this will give reliable information as to the variability of the Jewesses in each of the countries named. Arranged in groups of types of headform, we may compare them with the Jewish women of eastern Europe, wherever literature on the subject is available.

TABLE XXXIII

CEPHALIC INDEX OF JEWESSES IN THE UNITED STATES AND IN EASTERN EUROPE

Type of Headform.	Poland.		Lithuania and White Russia.		Little Russia.	
	New York.	Poland.	New York.	White Russia.	New York.	Little Russia.
-75	—	1.6	2.0	8.0	1.33	1.46
76-77	10.71	1.6	8.0	18.0	5.41	2.91
78-79	8.93	12.8	6.0	14.0	13.51	8.74
80-81	39.29	20.0	25.0	24.0	36.49	20.87
82-83	17.86	27.2	32.0	16.0	22.97	21.85
84-85	14.29	24.0	13.0	13.0	12.16	22.81
86+	8.93	12.8	14.0	7.0	8.11	21.36
No. observed.	56	120	100	100	74	206

There is no evidence of greater dolichocephaly in the immigrant Jewesses, as was seen to be the case with the Jews. Thus in Galicia the average cephalic index of the Jewesses was found

[1] Karl Pearson, "The Chances of Death," chapter on "Variation in Men and Women."

to be 80.3 (Majer and Kopernicki), while the immigrant Jewesses from that country have an index of 84.83 on the average; in Poland the cephalic index of the Jewesses in Warsaw measured by Elkind was 82.92, while those from that country who emigrated to the United States are seen to have an average index of 81.77; in White Russia the Jewesses observed by Yakowenko are more longheaded (81.24) than those who emigrated to the United States (83.23); and in Little Russia, Weissenberg found the Jewesses with an average index of 82.4, and Talko-Hryncewicz 83.0, almost the same as that in the immigrant Jewesses from that region of Russia — 82.22. It is thus seen that with but one exception, the Polish Jewesses, the immigrant women are slightly more brachycephalic than those who remain at home. This is confirmed by the figures in Table XXXIII, which show that the proportion of dolichocephalic Jewesses is considerably larger in those who were measured in their native country than in the immigrants, excepting in those coming from Little Russia. The proportion of brachycephalic among the immigrant Jewesses in each group bears no

TABLE XXXIV

CEPHALIC INDEX OF JEWISH AND NON-JEWISH WOMEN IN EASTERN EUROPE

Country.	Number Observed.	Average Cephalic Index.	75 and less.	76 and 77.	78 and 79.	80 and 81.	82 and 83.	84 and 85.	86 and more.	Observer.
Poland.										
Jewesses.	181	83.18	1.10	4.22	11.60	25.97	24.31	21.00	11.60	Fishberg, Elkind.
Poles.	153	81.35	4.03	10.07	21.48	28.19	16.78	12.75	6.70	Elkind.
Lithuania.										
Jewesses.	200	82.00	5.00	13.00	10.00	24.5	24.00	13.00	10.50	Fishberg, Yakowenko
Letto-Lith.	107	80.60	4.67	14.95	11.21	26.17	17.76	11.21	14.03	Talko-Hryncewicz.
White Russ.	141	82.30	7.09	0.71	9.93	25.53	23.40	21.28	12.06	Talko-Hryncewicz.
Little Russia.										
Jewesses.	280	82.72	1.43	3.57	10.00	25.00	22.14	20.00	17.86	Fishberg, Talko-Hryncewicz.
Little Russ.	237	83.40	—	2.53	8.02	14.34	30.80	19.41	24.90	Talko-Hryncewicz.

relation to the proportion found among the Jewesses measured at home, hence no definite conclusions can here be drawn as to any form of social selection being at work.

When compared with the non-Jewish women of the countries in which these Jewesses have lived, it is found also that they do not follow the rule observed in men. They are not more dolichocephalic in countries where the indigenous women are so, nor are they more dolichocephalic in other places, as can be seen from Table XXXIV. The averages are the same as those in the non-Jewish women, but the distribution of the various classes of headform does not correspond to that of the Gentiles. Possibly this is due to the limited number of observations on Jewesses, or there is some other reason that is not apparent to the present writer.

The Horizontal Circumference of the Head

The average horizontal circumference of the head of 1,528 Jews was 55.55 cm. (twenty-two inches). The range of extreme individual variation was rather small. With a maximum of 64.3 cm., and a minimum of 48.2 cm., the variation extended over only 16.1 cm., or 29 percent of the average. This is much smaller than that which has been found for the stature of the Jews, the length and width of the head, etc. The accompanying table gives in detail the number and percentage of individuals with a given size of head, at intervals of five millimeters. It will be observed that while the maximum number of individuals (12.83 percent) had heads corresponding to the average, 55.55 cm., still the frequency of occurrence on both sides of the median does not progressively get smaller. A curve drawn from these figures does not run so smooth a course as we have observed to be the case with other measurements of the head of the Jews. This is explainable by the fact that the chances of error in observation are very great while taking measurements of the horizontal circumference of the head with the tape — far greater than when straight lines are measured with the calipers. This condition has influenced the present writer to such an extent that he has discarded the measurements of the horizontal cir-

Table XXXV

Horizontal Circumference of the Head

mm.	Number.	Percent.	mm.	Number.	Percent.
481–485	1	0.07	566–570	173	11.32
486–490	—	—	571–575	101	6.61
491–495	1	0.07	576–580	67	4.38
496–500	—	—	581–585	49	3.21
501–505	5	0.33	586–590	29	1.89
506–510	2	0.13	591–595	15	0.99
511–515	13	0.85	596–600	9	0.60
516–520	13	0.85	601–605	4	0.26
521–525	34	2.21	606–610	1	0.07
526–530	35	2.28	611–615	1	0.07
531–535	66	4.32	616–620	—	—
536–540	95	6.21	621–625	1	0.07
541–545	162	10.60	626–630	1	0.07
546–550	149	9.75	631–635	1	0.07
551–555	165	10.80	636–640	1	0.07
556–560	196	12.83			
561–565	138	9.02	Total.	1,528	100.00

cumference of the head in women as worthless, because owing to the hair and the head-dress the difficulties are too serious to overcome.

The circumference of the head was 33.77 percent of the average stature ($100 \times \frac{5}{16}\frac{5}{4}\frac{5}{5} = 33.77$). The men who were 170 cm. or more in height had relatively smaller heads than those who were short of stature — 160 cm. and less. This is best seen in the accompanying tables :

Stature.	Average Stature.	Average Circumference of the Head.	Percent of Stature.
Tall (more than 160 cm.)	173.4	56.05	32.32
Above the average	167.1	55.79	33.38
Below the average	162.6	55.62	34.21
Short	156.1	54.79	35.10

which shows that while with the increase of stature the horizontal circumference of the head also increases, but when considered in relation to stature, the size of the head decreases. The men of short stature had a head-circumference of 35.1 percent of their body height, while the tall men's heads averaged only 32.32 percent of their stature. This is further seen in the following table :

Stature.	Calculated Circumference of the Head.	Observed Circumference of the Head.	Difference (in cm.).
Tall	58.56	56.05	—2.51
Above the average	56.43	55.79	—0.64
Below the average	54.91	55.62	+0.71
Short	52.71	54.79	+2.08

We see from these figures that the short men measured around their heads 2.08 cm. more than would be expected if their heads were as large in proportion to stature as the average of all the Jews measured. On the other hand, the tall men had heads 2.51 cm. shorter, as would theoretically be expected.

There is practically no difference in the absolute and relative circumference of the head of the Jews from various countries in eastern Europe, as is to be seen from the following figures:

Nativity.	Average Circumference of the Head.	Percent of Stature.
Galicia	55.10	33.35
Poland	55.42	33.92
Lithuania	55.61	33.87
Little Russia	55.62	33.56
Roumania	55.81	33.62
Hungary	55.77	33.66
United States	56.18	33.46

Measurements taken on Jews in eastern Europe agree closely with our results: the circumference of the head is 55 cm. to 56 cm. on the average. It should be noted also that the same is about the average of the non-Jewish races in these parts of Europe.

CHAPTER V

The Face

The height of the face was measured with calipers by taking the distance from the root of the nose to the point beneath the middle of the chin. The average height was 119 mm. in Jews, and 109 in Jewesses. The maximum height was 142 mm. in men and 128 in the women; the minimum 98 mm. in men and 90 in the women. The amplitude of extreme individual variation

Table XXXVI

Height of the Face of Jews and Jewesses

Height of the Face (in mm.).	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
89– 90	—	—	1	0.23
91– 92	—	—	—	—
93– 94	—	—	1	0.23
95– 96	—	—	11	2.52
97– 98	1	0.07	12	2.76
99–100	4	0.26	17	3.91
101–102	5	0.33	20	4.59
103–104	12	0.78	25	5.77
105–106	20	1.31	49	11.26
107–108	27	1.77	34	7.82
109–110	82	5.37	69	15.86
111–112	85	5.56	48	11.04
113–114	99	6.48	37	8.51
115–116	153	10.01	47	10.80
117–118	170	11.12	25	5.76
119–120	234	15.32	26	5.95
121–122	149	9.75	5	1.15
123–124	122	7.98	5	1.15
125–126	126	8.24	1	0.23
127–128	70	4.58	2	0.46
129–130	106	6.94	—	—
131–132	36	2.36	—	—
133–134	12	0.79	—	—
135–136	8	0.52	—	—
137–138	4	0.26	—	—
139–140	2	0.13	—	—
141–142	1	0.07	—	—
Total.	1,528	100.00	435	99.98

is very large, amounting to 44 mm. or 37.9 percent of the average in the men, and 38 mm. or 34.86 percent of the average in the women. The great variability of this measurement is also seen from the large value of the standard deviation, which was 6.56 in the men, and 6.52 in the women. It is thus much larger than the standard deviation of any other measurement obtained

TABLE XXXVII

WIDTH OF THE FACE OF JEWS AND JEWESSES

Width of the Face (in mm.).	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
105–106	—	—	1	0.23
107–108	—	—	1	0.23
109–110	—	—	—	—
111–112	—	—	5	1.15
113–114	1	0.07	3	0.69
115–116	1	0.07	11	2.53
117–118	8	0.52	9	2.07
119–120	13	0.84	28	6.42
121–122	29	1.89	35	8.05
123–124	26	1.70	37	8.51
125–126	54	3.54	53	12.18
127–128	65	4.25	59	13.57
129–130	175	11.45	77	17.70
131–132	186	12.18	44	10.12
133–134	130	8.51	29	6.66
135–136	206	13.48	22	5.05
137–138	174	11.39	13	2.99
139–140	156	10.21	5	1.15
141–142	127	8.31	2	0.46
143–144	79	5.17	1	0.23
145–146	55	3.60	—	—
147–148	28	1.83	—	—
149–150	8	0.52	—	—
151–152	3	0.21	—	—
153–154	2	0.13	—	—
155–156	2	0.13	—	—
Total.	1,528	100.00	435	99.99

on the Jews, excepting that of the nose. The probable error was 0.112 in men and 0.149 in the women. The seriation of the measurements, as seen in Table XXXVI shows a striking uniformity of type. The apex of the curve for the measurements in men corresponds to the median, and on both sides the values are quite evenly distributed; the percentage of individuals with a given height of the face becomes progressively smaller the

farther it is from the median. There is, however, no such uniformity to be observed in the curve for the women ; here there are four apices observable, which would seem to indicate a greater variability in height of face of the Jewesses.

The average width of the face was as follows :

	Average.	Maximum.	Minimum.
Jews	135	156	114
Jewesses	127	143	107

The range of extreme individual variation was in Jews 31.11 percent, and in Jewesses 28.34 percent of the average width of the face, which would indicate a lesser variability than that observed in the height of the face of the Jews. The standard deviation is, however, large. In men it is found to amount to 6.25, and in the women, 5.87. The probable error also is large, in the men, 0.1072, and in the women, 0.1895, about the same as in the case of the height of the face. The distribution of the various values obtained by measurement is given in the accompanying table XXXVII, showing that in both men and women there is a fair uniformity of type.

There is very little difference in the average width and height of the face of Jews from various countries, as may be seen from the following figures :

Nativity.	Average height.		Average width.	
	Jews.	Jewesses.	Jews.	Jewesses.
Galicia	119	107	132	128
Poland	119	110	132	129
Lithuania and White Russia	119	109	135	126
Little Russia	120	110	137	125
Roumania	120	113	135	128
Hungary	119	110	136	127
United States	120		124	

The average height is in each group 119 or 120 mm. in the Jews and 107 to 113 mm. in the Jewesses. The slight difference in the Jewesses may be explained by the comparatively small number of observations. The width of the face is likewise almost the same in each group.

The Facial Index

The average of the facial index was 88.15 in men and 85.83 in women. The variability was considerable, as can be seen from Table XXXVIII. It extended in the men over 38 units (maximum 107, minimum 69), or 43 percent of the average; in women over 30 units (maximum 100, minimum 70), or 35 percent of the average. The standard deviation was 5.83 in men and 5.7 in the women; the probable error, in men 0.1, and in women 0.18.

Table XXXVIII

Facial Index of Jews and Jewesses

Facial Index.	Men.		Women.	
	Number.	Percent.	Number.	Percent.
69– 70	1	0.07	1	0.23
71– 72	3	0.21	1	0.23
73– 74	11	0.72	6	1.38
75– 76	16	1.05	16	3.68
77– 78	33	2.16	15	3.45
79– 80	75	4.90	35	8.05
81– 82	111	7.26	46	10.57
83– 84	162	10.60	43	9.89
85– 86	193	12.63	65	14.94
87– 88	222	14.53	61	14.02
89– 90	190	12.43	52	11.95
91– 92	172	11.26	34	7.82
93– 94	128	8.37	27	6.21
95– 96	92	6.02	20	4.59
97– 98	48	3.14	6	1.38
99–100	46	3.01	6	1.38
101–102	14	0.91	1	0.23
103–104	6	0.40	—	—
105–106	2	0.13	—	—
107–108	3	0.21	—	—

There is little difference in the facial index of Jews from various countries, as may be seen from the following figures:

Nativity.	Facial Index.	
	Men.	Women.
Galicia	90.15	83.59
Poland	90.15	85.27
Lithuania and White Russia	88.15	86.51
Little Russia	87.59	88.00
Roumania	88.89	88.28
Hungary	87.50	86.62
United States	87.59	

CHAPTER VI

The Nose

The measurement, shape, and form of the nose have been considered by anthropologists to be more or less fixed in the various races of mankind, and are consequently a valuable test of race. "Few physical characters yield more uniform results than does the nose. . . . A careful study of this organ shows almost better than any other the coördination of parts in the facial features generally."[1] Of the various measurements and characteristics suggested by Topinard as of value in the study of this organ,[2] I have taken measurements of only the height and width of the nose, calculated the nasal index in 1,510 Jews and in 423 Jewesses, and taken notes of the shape and form in 2,836 Jews and 3,284 Jewesses. Measurements of the upper width of the nose (the distance between the inner angles of the eyes), the projection, extreme length, etc., could not be obtained in sufficient number, because of the objection on the part of a majority of the individuals measured to excessive manipulation on my part around the nose.

Height of the Nose

The average height of the nose, measured from the root to the subnasal spine, was found to be in 1,510 Jews, 52 mm., and in 423 Jewesses, 47 mm. The maximum height in the Jews was 66 mm., and in the Jewesses 58 mm.; the minimum height, in Jews, 40 mm., and in Jewesses, 39 mm. The range of extreme individual variation is thus seen to be very great, 50 percent of the average height in men and 40.42 percent in women. In the case of the stature of the Jews, which is a very fluctuating character, this was only 31.61 percent of the average value, and in the length and width of the head it was even smaller.

[1] A. H. Keane, "Ethnology," Cambridge, 1901, p. 185.

[2] P. Topinard, "Eléments d'anthropologie génerale," pp. 301–307; also A. Bertillon, "Morphologie du Nez," *Rev. d'Anthropologie*, 3d series, Vol. II, 1887.

TABLE XXXIX

HEIGHT OF THE NOSE OF JEWS

Height of the Nose.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
39–40	1	0.06	5	1.18
41–42	8	0.52	25	5.91
43–44	30	1.99	58	13.71
45–46	65	4.31	70	16.55
47–48	135	8.94	88	20.80
49–50	270	17.88	91	21.52
51–52	305	20.19	62	14.66
53–54	299	19.81	19	4.49
55–56	198	13.12	4	0.95
57–58	92	6.10	1	0.23
59–60	69	4.57	—	—
61–62	24	1.59	—	—
63–64	10	0.66	—	—
65–66	3	0.19	—	—
71	1	0.06	—	—
Total.	1,510	99.99	423	100.00

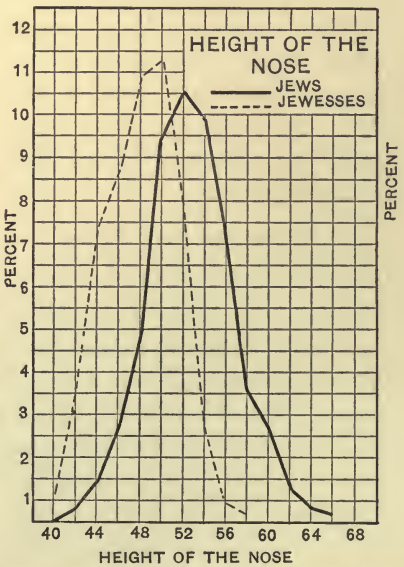

FIG. 10.—Height of the nose in Jews and Jewesses.

In Table XXXIX is given the seriation of the values obtained by measurement of the height of the nose at intervals of two

mm. It will be observed that the height of the nose in the largest proportion of individuals was equal to that of the average and median value. This is evident in both the men and women; in the latter it appears that the height of 49 to 50 mm. was more frequent than the height of 47 to 48 mm., but the difference was very small, less than one percent.

The standard deviation is quite large — 4.008 in the Jews and 3.368 in Jewesses. The probable error is in men 0.06947, and in women 0.1099. This indicates a greater variability in the women, which is to be attributed to the fact that the number of Jewesses examined is about one-third that of Jews.

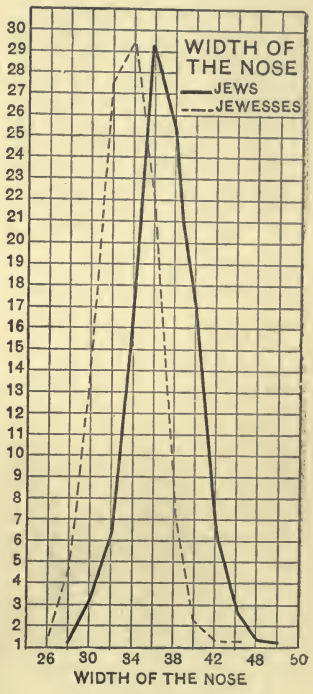

FIG. 11.

WIDTH OF THE NOSE

The width of the nose was taken with a sliding compass by measuring the distance of the alæ without compressing them. The average width of the nose is 36.35 mm. in Jews, and 32.92 mm. in Jewesses. The maximum width was in men 48 mm., and in women 43 mm. The minimum width of the nose was 27 mm. in men and 25 mm. in women. The difference between the maximum and minimum width of the nose was 21 mm. or 43.75 percent of the average width in the Jews, and 18 mm. or 54.54 percent of the average in the Jewesses. The variability of the nose in women is thus shown to be greater than that of the men.

Table XL shows the seriation of the values obtained by measurement of the width of the nose in Jews and Jewesses. The average width corresponds to the median and is in the most frequently occurring group. A curve plotted from these figures will run a more or less smooth course.

TABLE XL

WIDTH OF THE NOSE IN JEWS AND JEWESSES

Width of the Nose.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
25–26	—	—	1	0.23
27–28	3	0.19	16	3.78
29–30	33	2.19	53	12.53
31–32	82	5.44	112	26.48
33–34	234	15.50	121	28.61
35–36	428	28.34	86	20.33
37–38	368	24.37	27	6.39
39–40	244	16.16	5	1.18
41–42	83	5.50	1	0.23
43–44	26	1.72	1	0.23
45–46	6	0.40	—	—
47–48	3	0.19	—	—
Total.	1,510	100.00	423	99.99

The standard deviation is 2.968 for the Jews and 2.567 for the Jewesses — much smaller than in the case of the height of the nose. The probable error is in men 0.5328, and in women 0.8364.

There is almost no difference in the average height and width of the nose of the eastern European Jews, as may be seen from the following figures:

Country.	No. Observed.	Average.	
		Height.	Width.
Galicia.			
Men	295	52	36
Women	117	47	33
Poland.			
Men	307	51	37
Women	56	47	33
Lithuania and White Russia.			
Men	275	52	36
Women	100	48	33
Little Russia.			
Men	219	53	37
Women	67	48	33
Roumania.			
Men	150	52	36
Women	44	52	36
Hungary.			
Men	140	51	36
Women	39	47	32
United States.			
Men	124	53	36

The Nasal Index

The nasal index, calculated by multiplying the width of the nose by 100 and dividing the product by the height of the nose, was in men 69.23 and in women 69.14—identical in both sexes. The distribution of the individual indices according to Collignon's classification, is as follows:

	Men.		Women.	
	Number.	Percent.	Number.	Percent.
Leptorrhinian (index less than 70)....	760	50.53	210	49.65
Mesorrhinian (index 70 to 84.9).....	692	45.83	202	47.75
Platyrrhinian (index 85 to 100)	58	3.84	11	2.60
Total.....	1,510	100.00	423	100.00

It is evident from these figures that both Jews and Jewesses are generally leptorrhinian. Broad noses are quite infrequent,

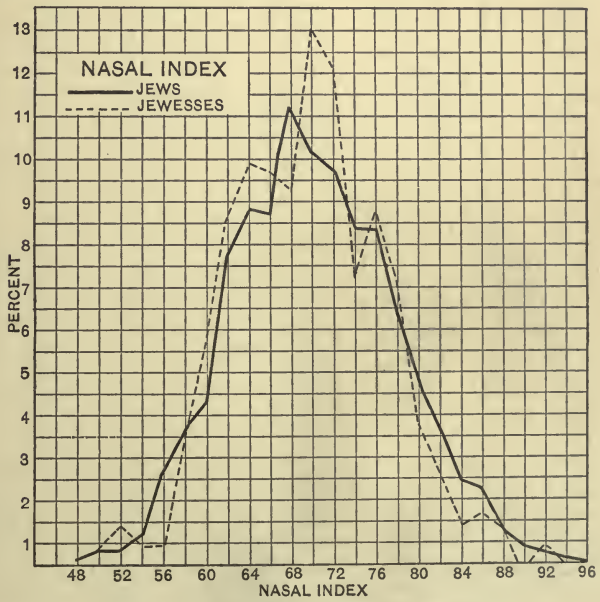

Fig. 12.—Nasal index of Jews and Jewesses.

only 3.84 percent of men and 2.60 percent of women had nasal indices of over 85.

The maximum nasal index was in men 100 and in women 92; the minimum, in men 40 and in women 49. It is thus shown that the extreme individual variation extended as follows: In the Jews the maximum was 44.92 percent larger and the minimum 42.03 percent smaller than the average nasal index; in the Jewesses these figures stand 33.33 and 29.00 percent respectively. The range of extreme individual variation, as in-

TABLE XLI

NASAL INDEX IN JEWS AND JEWESSES

Basal Index.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
40	1	0.06	—	—
47– 48	2	0.13	—	—
49– 50	6	0.40	2	0.47
51– 52	6	0.40	4	0.95
53– 54	18	1.19	2	0.47
55– 56	33	2.19	2	0.47
57– 58	48	3.18	12	2.84
59– 60	56	3.71	22	5.20
61– 62	109	7.22	34	8.04
63– 64	127	8.41	40	9.45
65– 66	125	8.28	39	9.21
67– 68	162	10.73	37	8.75
69– 70	145	9.60	53	12.53
71– 72	138	9.13	47	11.53
73– 74	119	7.88	28	6.62
75– 76	118	7.82	35	8.28
77– 78	91	6.00	28	6.62
79– 80	67	4.44	14	3.31
81– 82	51	3.38	9	2.13
83– 84	30	1.99	4	0.95
85– 86	26	1.72	5	1.18
87– 88	11	0.73	4	0.95
89– 90	7	0.46	—	—
91– 92	5	0.33	2	0.47
93– 94	4	0.28	—	—
95– 96	3	0.19	—	—
97– 98	—	—	—	—
99–100	2	0.13	—	—
Total.	1,510	99.98	423	100.00

dicated by the difference between the maximum and minimum, was 86.95 percent of the average nasal index in the Jews and 62.32 percent in the Jewesses. This can be considered a very large variability, larger in men than in women, and again confirming the fact that the nose is the most variable of the traits we have studied in the Jews.

The accompanying table (XLI) shows the distribution of the individual nasal indices at the interval of two units. It will be observed that individuals with a nasal index of 69 are the most common among the Jewesses; in the Jews, the most frequent nasal index is 67, and not 69, the average. A curve

TABLE XLII

NASAL INDEX OF THE JEWS ACCORDING TO THEIR NATIVITY

Nasal Index.	Galicia.	Poland.	Lithuania and White Russia	Little Russia.	Roumania	Hungary.	United States.
40	0.34	—	—	—	—	—	—
47– 48	0.34	—	—	—	—	—	—
49– 50	1.02	0.32	0.36	—	0.67	0.71	—
51– 52	0.67	0.32	0.36	—	—	—	1.61
53– 54	1.70	1.96	—	0.45	2.67	—	1.61
55– 56	3.73	0.98	1.45	2.28	2.67	1.42	3.23
57– 58	3.05	0.98	4.73	2.74	4.00	2.86	5.65
59– 60	4.75	2.28	3.28	3.65	3.33	5.72	4.03
61– 62	9.15	4.56	10.18	8.67	4.00	5.72	5.65
63– 64	9.83	7.17	6.91	9.13	10.00	10.00	6.45
65– 66	6.10	7.82	6.18	9.13	9.33	9.29	15.32
67– 68	7.12	13.03	10.55	11.87	16.67	5.72	10.49
69– 70	9.50	11.73	7.64	11.42	10.00	7.86	7.26
71– 72	9.83	7.49	9.09	10.50	7.33	11.43	8.87
73– 74	6.44	7.82	8.73	9.13	8.67	4.30	10.49
75– 76	8.82	11.40	7.27	5.02	6.00	8.57	4.03
77– 78	4.41	6.84	5.46	4.57	4.00	11.43	8.07
79– 80	5.76	3.58	5.46	5.02	2.67	5.00	1.61
81– 82	2.37	4.23	5.82	2.74	2.00	3.57	0.80
83– 84	2.03	1.96	2.54	2.28	2.00	2.86	—
85– 86	1.70	2.93	1.45	0.45	1.33	0.71	2.42
87– 88	0.67	0.32	0.73	0.91	—	0.71	1.61
89– 90	0.34	0.32	0.73	—	2.00	-	—
91– 92	—	1.30	—	—	—	0.71	- -
93– 94	—	0.32	0.36	—	0.67	1.42	—
95– 96	0.34	—	0.36	—	—	—	0.80
97– 98	—	—	—	—	—	—	—
99–100	—	0.32	0.36	—	—	—	—
Number.	295	307	275	219	150	140	124
Average.	69.23	72.55	69.23	69.81	69.23	70.59	67.92
Maximum.	95.34	100.00	100.00	88.74	93.18	93.74	95.42
Minimum.	40.14	50.18	50.79	54.23	50.94	48.27	51.83

drawn from these figures displays a striking variability of the nasal index. Although each ordinate is made up of two units, instead of one as in the case of the cephalic index, it is to be noted that the curve is very irregular in its course, and its legs

on both sides diverge widely—they are not so close together as those in the cephalic index curve. All this again emphasizes the great variability in the nose of the Jews.

This great variability in the form of the nose in Jews is again displayed when the standard deviation is calculated: it amounted to 8.07 in Jews and 7.117 in Jewesses, which is larger than that of any other trait thus far considered in our investigation. The probable error is correspondingly large: 0.1396 in Jews and 0.2333 in Jewesses. The difference in the nasal index of the Jews according to nativity is almost insignificant, as can be seen from Table XLII, which gives the seriation of the nasal index in Jews and Jewesses according to country of birth.

TABLE XLIII

NASAL INDEX OF JEWESSES ACCORDING TO NATIVITY

Nasal Index.	Galicia.	Poland.	Lithuania and White Russia.	Little Russia.	Roumania.	Hungary.
49–50	0.85	—	—	—	2.27	—
51–52	1.71	—	—	—	4.55	—
53–54	—	—	—	2.99	—	—
55–56	—	1.79	—	—	—	2.56
57–58	1.71	—	4.00	4.48	4.55	2.56
59–60	2.57	1.79	9.00	5.97	4.55	7.69
61–62	6.00	3.57	9.00	8.96	18.18	5.13
63–64	6.00	10.71	12.00	13.43	9.09	5.13
65–66	9.40	12.50	5.00	7.46	11.36	15.38
67–68	8.55	8.93	9.00	8.96	2.27	15.38
69–70	14.53	17.86	14.00	5.97	6.82	12.82
71–72	12.82	10.71	10.00	13.43	9.09	7.69
73–74	11.11	5.36	1.00	5.97	9.09	7.69
75–76	10.25	5.36	9.00	7.46	4.55	10.26
77–78	5.13	12.50	8.00	4.48	6.82	2.56
79–80	1.71	3.57	5.00	5.97	—	2.56
81–82	3.42	1.79	1.00	2.99	2.27	—
83–84	1.71	—	2.00	—	—	—
85–86	0.85	1.79	1.00	—	4.55	—
87–88	0.85	1.79	—	—	—	2.56
89–90	—	—	—	—	—	—
91–92	0.85	—	—	1.49	—	—
Number.	117	56	100.00	67	44	39
Average.	70.21	70.21	68.75	68.75	69.23	68.09
Maximum.	91.49	87.36	88.12	92.42	86.23	88.18
Minimum.	49.09	50.58	57.34	54.13	50.33	55.14

The Shape of the Nose

The "Jewish" nose has been considered characteristic. Caricaturists have exploited this part of the Jewish anatomy to an extent which, as we shall see hereafter, is not warranted by statistical facts. Whenever a Jewish face is pictured, a hooked nose, one which resembles the beak of a parrot, is generally portrayed. Even anthropologists have been led astray by this popular notion. Topinard, in his classification of noses, calls the hooked nose the Jewish or Semitic nose. He enumerates several varieties of convex nose, generally known as aquiline — the simple aquiline, the "arched," some of which have the appearance of the beak of the parrot, others of the eagle ("bec de perroquet," "bec d'aiglé"), according to the direction taken by the extreme point of the nose. But the investigations of anthropologists do not bear out the contention that the hook nose is characteristic of the Jews, at least as far as Jews from eastern Europe are concerned.

The present author has taken notes on the shape of the nose in 4,120 Jews in New York City, which includes Jews from all parts of Europe as well as natives. The results are shown in the following table:

Variety of Nose in 4,120 Jews and Jewesses

Variety of Nose.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
Straight	1,624	57.26	763	59.42
Hooked, aquiline	404	14.25	163	12.70
Retroussé (snub)	626	22.07	178	13.86
Flat and broad	182	6.42	180	14.02
Total	2,836	100.00	1,284	100.00

This shows that the predominant variety of nose-form among the Jews in New York City is the straight — 57 percent of Jews and 59 percent of Jewesses had straight noses. This variety of nose is known as the "Greek" nose, because the ancient Greek sculptors have usually produced in their statues faces with straight noses. But noses modeled after the form of the Greek monuments are very rare among all races. This is true partic-

ularly of that part where the root of the nose joins the forehead, which is represented in the productions of the masters as nearly straight, with almost no depression at all. The straight noses observed in the modern population of Europe show a more or less deep indentation at the root, while the dorsum is more or less straight.

The "retroussé," concave, or "snub" (known popularly as the "saucy") nose was observed in 22 percent of the Jews and in 13 percent of the Jewesses. This variety of nose is usually short and comparatively broad; when looked at in profile the dorsum is seen to be short and but little elevated, while the nostrils are often directed upward on both sides. The root is generally broad and low, and the dorsum concave, but the concavity may be of varying degree. It appears that Galician Jewesses very frequently have this form of nose. It is also of very frequent occurrence in the Slavic races, particularly in the Ukraine among the Little Russians, and in Galicia among the Ruthenian peasantry. It is a striking fact that the concave nose is also most often encountered among the Jews coming from these localities.

The proportion of hooked noses among the Jews in New York was found to be 14 percent in the men and 12 percent in the women, which contradicts flatly the prevailing popular notion that every Jew is the possessor of a hooked nose. This fact is also confirmed by statistics given in the works of other investigators. Thus, Majer and Kopernicki found among the Galician Jews 30.9 percent of hook noses; Blechman in Russia only 2 percent; Weissenberg in southern Russia only 14 percent; in Poland Elkind reports only 10 percent in Jews and 4 percent in Jewesses; Yakowenko in White Russia found only 9.79 percent, and Talko-Hryncewicz found among the Jews of the Ukraine 26.3 percent of hook noses in the men, and among the women only 18.9 percent; while among the Lithuanian Jews the proportion was only 21.7 percent. We thus see that the proportion of hook noses among the Jews fluctuates between 2 and 30 percent — by no means so universal as caricaturists would lead one to believe. It is remarkable that hook noses are not

infrequent in the non-Jewish population of eastern Europe. Among the Poles in Galicia 6.4 percent have this variety of nose, and the Ruthenians of the same country also have 6 percent of hook-nose individuals (Majer and Kopernicki). Among the Little Russians Talko-Hryncewicz found over 10 percent among both men and women. The hook nose is thus not much more often encountered among the eastern European Jews than among the Gentile population of this region. On the other hand, in Asia Minor and in the Caucasus the arched or "Jewish" nose is very often seen among the indigenous races, such as the Armenians, Syrians, Georgians, Ossetts, Lesghians, Aisores, etc.; in fact, this form of nose is among these races more frequent than among the eastern European Jews.

There are various explanations why people in general as well as artists and even men of science have considered the arched nose peculiarly Jewish. Beddoe believes that it is due to a characteristic tucking up of the wings. Joseph Jacobs concludes that "the nose does contribute much toward producing the Jewish expression, but it is not so much the shape of its profile as the accentuation and flexibility of the nostrils." From his composite photographs of Jewish faces he shows that when the nose is covered the Jewish expression disappears entirely, and that it is the so-called "nostrility" which makes these composites "Jewish." "A curious experiment illustrates this importance of the

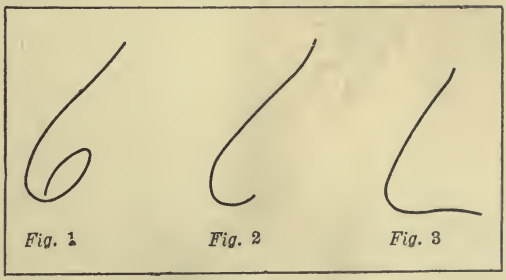

FIG. 13.

nostril toward making the Jewish expression. Artists tell us that the very best way to make a caricature of the Jewish nose

is to write a figure 6 with a long tail (fig. 1); now remove the turn of the twist as in fig. 2, and much of the Jewishness disappears; and it vanishes entirely when we draw the continuation horizontally as in fig. 3. We may conclude then that, as regards the Jewish nose, it is more the Jewish nostril than the nose itself which goes to form the characteristic Jewish expression."[1] Ripley agrees with Jacobs on this point, and concludes that next to dark hair and eyes and a swarthy skin, the nostrils are the most distinctive feature among the Jews.[2] It is to be regretted that during this investigation of the somatology of the Jews, the present writer has taken no statistics of the frequency of this so-called nostrility, and is not in a position to either confirm or deny the contention. As it is, it seems that the "nostrility" is mostly found among those Jews who have arched noses, and is only rarely observed in those with straight or snub noses, and that among the inhabitants of Asia Minor and the Caucasus, who, as was already mentioned, have arched noses, this nostrility is also very frequent.

[1] J. Jacobs, "On the Racial Characteristics of Modern Jews," *Journ. Anthropol. Institute*, 1886, XV, pp. 23–62.

[2] Wm. Z. Ripley, "The Races of Europe," p. 395.

CHAPTER VII

Pigmentation

Judging from Biblical data, it appears that the color of the hair of the ancient Hebrews was black; "raven black" appears to have been the ideal of beauty, as is seen from Cant. IV, 1; V, 11. Black hair is designated as a sign of youth in contrast with the white hair of old age. Josephus narrates that Herod dyed his gray hair black in order to appear younger.[1] Black hair was considered beautiful, says Benzinger, black being the general color, while light or blond hair was exceptional.[2] King David and also Esau are credited with having red or "ruddy" hair.[3] The color of the eye is not indicated in the Bible or the Talmud, although this organ is mentioned more than 800 times in the Bible, and is described in detail as regards other characteristics, such as the anatomy, expression, etc. It may be mentioned in this connection that according to some Hebrew scholars there is no equivalent in the Hebrew language for "blue" in either Bible or Talmud.

If black was the color of the hair of the ancient Hebrews, then it is evident that the modern Jews have not preserved the type. Our investigations of this trait have included 4,235 individuals over twenty years of age; of these 2,716 were men and 1,519 women. Besides the color of the hair and eyes, observations have been made on grayness, baldness, and freckles, and also on the variety of the hair.

As will readily be observed by one who attempts to distinguish the degrees of pigmentation of the skin, hair, and eyes, there is often considerable difficulty in deciding which color to assign a given individual. It is quite easy to distinguish golden blond from black or dark brown hair. But between these two

[1] "Ant.," XVI, 8, 1, quoted from Jewish Encyclopedia, Vol. VI, p. 157.

[2] Art, "Hair," Jewish Encyclop., VI, p. 157.

[3] I Samuel, XVI, 12; XVII, 42; Genesis XXV, 25.

extremes there are found minor gradations which are not easily separated, and one often remains in doubt as to the class with which he is dealing. There also arises a problem concerning the number of colors into which it is advisable to divide the material. Some anthropologists distinguish as many as fifteen colors of skin, hair, or eyes; while the late Dr. Virchow, in his classical elaboration of the material on the color of skin, hair, and eyes of German school children, collected by the German Anthropological Society,[1] distinguishes only two colors for the skin (fair and dark), four for the hair (blond, brown, black, and red), and three for the eyes (blue, gray, and brown). This classification we have adopted, with only slight modifications; we distinguish six classes of hair coloration — black, brown, chestnut, light chestnut, blond, and red.

The distinction between fair and dark skin is not always readily apparent, and in doubtful cases we have been guided by the general impression gained by a careful inspection at a distance from one to two meters from the individual. Only those whose skin appeared brownish or swarthy were taken as dark, and those having a yellowish or somewhat muddy tint were regarded as fair.

The hair was considered black when the darkness was very deep, without a brownish tinge. Such hair usually has a luster which by reflected light gives it a bluish appearance, but this luster is not observable in black hair which is not kept scrupulously clean by frequent brushing.

Brown hair was considered to be that which, although fairly dark, did not show a luster, or in reflected light presented a brownish tinge. It is sometimes difficult to distinguish this color from black, particularly in hair the care of which has been neglected. Quite often "brown" hair will appear decidedly black when thoroughly cleaned and brushed.

As chestnut we regarded hair which by its coloration did not appear positively brown but which was not fair enough to be termed blond. As this class includes many gradations of color,

[1] "Gesamtbericht über die Farbe der Haut, der Haare und der Augen der Schulkinder in Deutschland," *Archiv für Anthropologie*, 1886, XVI, pp. 275–475.

we have found it necessary to divide it into dark and light chestnut. Most hair here considered to be light chestnut may sometimes be taken for blond, especially when seen by direct sunlight, but close observation discloses a dark tinge. Much of the hair included in this class shows a somewhat rufous appearance, without being decidedly red; in other instances it is almost flaxen, but with a dark tinge.

Under blond we have classed hair which is almost white, as well as the flaxen, ashen, yellowish, and golden hair. Some of these have a more or less grayish tinge, others are even slightly rufous, while still others may be regarded as having no decided color at all.

There are many shades of red hair, ranging from fire-red through brownish-red to that which is almost blond but which has a decidedly rufous appearance. In doubtful cases we have been guided by other signs of erythrism, such as an abundance of freckles, and, where possible, by noting the color of the pubic hair, which is orange yellow in most cases of erythrism.

The color of the iris was observed at a distance of about one meter. Eyes showing the least degree of pigmentation were recorded as blue, but deeply pigmented eyes, with a dark bluish appearance on close observation, were not included in this class. Only eyes having no color at all or a mixture of light blue and gray were counted as blue. All dark eyes which were not decidedly black were recorded as brown. In this class are included the "beer-colored" eyes (very common among the eastern European Jews) and those having a deep dark tint which appears dark blue on close inspection. As gray were considered all eyes which could not be included in the above two classes; it consequently includes most of those which some observers have described as green, although many of these are essentially brown. Such cases as the latter have been classed among the brown eyes. Black eyes are usually brown on close inspection, but at a distance of about a meter the iris appears deep black and shows no difference in the color of the pupil.

The color of the skin was observed in 2,272 individuals, com-

prising 1,188 men and 1,084 women. It was found to be as follows:[1]

	Jews.		Jewesses.	
Dark skin	269	22.64	276	25.46
Fair skin	919	77.36	808	74.54
Total	1,188	100.00	1,084	100.00

This indicates that Jewesses have a slightly darker skin than Jews. According to Ploss and Bartels[2] the skin of women is usually fairer than that of men.

The distribution of the color of the hair is shown in the following table:

COLOR OF THE HAIR OF 4,235 JEWS IN NEW YORK CITY

Color of the Hair.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
Black	1,219	44.89	650	42.79
Brown	760	27.98	430	28.31
Chestnut { Dark	293	10.79	148	9.74
Chestnut { Light	191	7.03	137	9.02
Blond	165	6.08	94	6.19
Red	88	3.23	60	3.95
Total	2,716	100.00	1,519	100.00

Dividing the hair in three classes as dark, fair, and red, we find the proportion to be as follows:

Color.	Jews.	Jewesses.
Dark hair	83.66	80.84
Fair hair	13.11	15.21
Red hair	3.23	3.95

These figures show that over 80 percent of the hair in Jews is dark; they also indicate that the hair of Jewesses is fairer than that of Jews, which does not agree with the results obtained by other investigators of Jewish anthropology. Talko-Hryncewicz found that among the Jews in Lithuania and Little

[1] The figures for the Jewesses were, owing to a misprint, given as 25 percent fair skin and 74 percent dark skin (*American Anthropologist*, N. S., Vol. V, p. 92). This error is here corrected.

[2] "Das Weib," 7. Auflage, 1902, p. 26; seen also Havelock Ellis, "Man and Woman," London, 1895, pp. 223–230.

Russia the proportion of dark hair in the women is 84 percent, while among men it is only 60.3 percent. Light hair was found in only 16 percent of women and in 39.7 percent of men.[1] Weissenberg also found that Jewesses are darker than Jews, but his conclusions are based on only one hundred men and forty-one women.[2] Yakowenko also determined that dark hair is more frequent among Jewesses than among Jews, only seven of the former out of one hundred having light hair.[3] This authority remarks that dark hair is more common among women than among men, while blond hair is more frequent in men. The only investigator who found the Jews to be more brunette than the Jewesses is Elkind, who found among the Polish Jews 96.81 percent with dark and 0.53 percent with fair hair, as against 86.4 percent of dark, and 8.0 percent of fair hair among Jewesses.[4]

COLOR OF THE EYES IN 4,235 JEWS AND JEWESSES

Color of the Eyes.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
Black	570	20.99	314	20.67
Brown	925	34.06	621	40.88
Gray	597	21.98	288	18.96
Blue	624	22.97	296	19.49
Total	2,716	100.00	1,519	100.00

In the appended table are given the figures for the color of the eyes among the Jews investigated in New York City. It is seen that more Jewesses (61.55 percent) than Jews (55.05 percent) have dark eyes. Pure blue eyes also appear to be more frequent among the men than among the women — 22.97 percent in the former and 19.49 percent in the latter. On this point the observations of other investigators agree with those of our own.

[1] Julian Talko-Hryncewicz, "Charakterystika fizyczna ludnosci zydowskiej Litwi i Rusi," *Zbior Wiadomosci do antropologii Krajowej*, XVI, pp. 17–22, Krakow, 1892.

[2] S. Weissenberg, "Die südrussischen Juden," *Archiv für Anthropologie*, XXIII, p. 108 of reprint.

[3] M. G. Yakowenko, "Materials for the Anthropology of the Jews" (in Russian), p. 152, St. Petersburg, 1898.

[4] A. D. Elkind, "The Jews," *Publications of the Society of Friends of Natural Science, Anthropology and Ethnography*, CIV, pp. 37–47, Moscow, 1903.

Yakowenko[1] found 76 percent of Jewesses and only 69 percent of Jews with dark eyes. Of Talko-Hryncewicz's 799 Jewesses 61.8 percent had dark eyes; of his 869 Jews only 56.5 percent had dark eyes.[2] Similar results have been obtained by Weissenberg,[3] who found 75.6 percent of dark eyes in Jewesses and only 64.8 percent in Jews. From Elkind's investigations among Polish Jews[4] it appears that the percentage of dark eyes is about the same in both sexes.

Considering that the color of the hair and eyes is quite a stable trait, and but little if at all influenced by external conditions, it is of interest to investigate the proportion of fair and dark hair and eyes of the Jews grouped according to the country of their birth. If the proportion of fair-haired Jews is larger in countries where the non-Jewish population is blond, or the reverse, this may give us a clue as to the origin of the fair-haired Jews. In Table XLIV is given the percentage of Jews with a given tinge of hair and eyes among the immigrants in New York City. It will be seen that the proportions do not materially differ from those found among the total number of 2,272 individuals considered above, especially if it be noted that the number of observations in each group is comparatively small.

Observations to the effect that immigrants are of fairer complexion than people of the same stock who remain at home do not hold good for all Jewish immigrants. Thus, from Table XLV we see that among the Galician Jews only 15.41 percent of the immigrants have fair hair, as against 21.50 percent among the Jews in Galicia; and among the Jews who came to the United States from Lithuania and White Russia the same is true: 17.83 percent had fair hair in their native home, while only 9.82 percent of the immigrants from this region had fair hair. Of the immigrant Jews from Poland and Little Russia the same conditions are seen to be true. The Polish Jews alone show a larger percentage of fair-haired individuals among the

[1] *Loc. cit.*, p. 158.
[2] *Loc. cit.*, pp. 24–26.
[3] *Loc. cit.*, p. 108.
[4] *Loc. cit.*, p. 52.

TABLE XLIV

COLOR OF HAIR AND EYES OF JEWS ACCORDING TO NATIVITY

Nativity.	Color of the Hair.						Color of the Eyes.			
	Black.	Brown.	Chestnut		Blond.	Red.	Black.	Brown.	Gray.	Blue.
			Dark.	Light.						
Galicia.										
Men.	34.76	33.77	12.45	8.19	7.22	3.61	17.05	29.83	27.54	25.58
Women.	33.61	31.14	10.66	7.28	12.29	4.92	21.31	35.25	22.95	20.49
Poland.										
Men.	49.29	27.62	8.88	5.40	5.72	3.18	21.59	35.24	21.27	21.90
Women.	42.85	37.50	8.93	5.36	1.79	3.57	26.79	30.36	32.14	10.71
Lithuania.										
Men.	48.00	32.36	5.82	5.09	4.73	4.00	22.54	33.82	25.46	18.18
Women.	44.00	30.00	6.00	4.00	9.00	7.00	29.00	27.00	24.00	20.00
Little Russia.										
Men.	43.38	32.42	10.05	4.57	6.85	2.73	16.90	33.79	26.02	23.29
Women.	43.24	36.49	6.76	5.41	4.05	4.05	27.03	32.43	20.27	20.27
Roumania.										
Men.	49.33	29.33	4.67	7.33	7.33	2.00	18.67	30.00	31.33	20.00
Women.	36.36	29.55	18.18	6.82	6.82	2.27	18.18	31.82	25.00	25.00
Hungary.										
Men.	47.86	20.71	8.57	9.29	5.00	8.57	20.00	30.71	27.15	22.14
Women.	48.72	38.46	5.13	2.56	2.56	2.56	25.64	38.46	23.08	12.82
United States.										
Men.	35.48	37.09	12.10	7.26	4.03	4.03	20.97	34.68	24.19	20.16

TABLE XLV

COLOR OF HAIR AND EYES OF JEWS IN THE UNITED STATES AND IN EASTERN EUROPE

Country.	Number Observed.	Hair.			Eyes.		Observer.
		Dark.	Fair.	Red.	Dark.	Fair.	
Galicia.							
In New York.	305	80.98	15.41	3.61	46.88	53.12	Fishberg.
In Galicia.	944	74.00	21.50	4.30	53.81	46.19	Majer-Kopernicki.
Poland.							
In New York.	315	85.70	11.12	3.18	56.83	43.17	Fishberg.
In Poland.	188	96.81	0.53	2.66	55.00	45.00	Elkind.
Lithuania.							
In New York.	275	86.18	9.82	4.00	56.36	43.64	Fishberg.
In Lithuania.	314	81.53	17.83	0.64	68.47	31.53	Yakowenko, Talko-Hryncewicz.
Little Russia.							
In New York.	219	85.84	11.42	2.74	50.69	49.31	Fishberg.
In Little Russia.	869	76.40	19.30	4.30	56.73	43.27	Talko-Hryncewicz.

immigrants than among those left in their native homes. The proportion of fair eyes is slightly larger among the immigrants than among the Jews in their native countries, but the difference is so small as to be disregarded.

When compared with the indigenous populations of the countries of eastern Europe in which these Jews have lived, we find that they everywhere have a larger proportion of individuals with dark hair and eyes, excepting in Roumania. Thus in Galicia 75 percent of the Jews have dark hair as against only 54 percent of the Poles and Ruthenians; in Russian Poland the Poles have 78 percent with dark hair and the Jews 89 percent; the Little Russians have 53 percent and their Jewish neighbors 78 percent; even in Lithuania and White Russia, where the Letto-Lithuanians have only 16 percent and the White Russians 23 percent of dark-haired individuals, there are 83 percent of dark-pigmented Jews. In Roumania, however, the Jews have only 83 percent and the Roumanians 92 percent of dark hair. The same is true of dark eyes, the Jews having a comparatively larger number of individuals with dark eyes than the indigenous population of the particular country in eastern Europe among whom they have lived for centuries. On the other hand, fair hair and eyes are much more frequent among the non-Jews in these countries than among the Jews. Thus fair hair is found in 20 percent of the Galician Jews as against 45 percent of the Gentiles in that country; 7 percent among the Polish Jews, and 21 among the Poles; in Little Russia, 17 percent among the Jews, and 46 among the Little Russians; and in Lithuania, where the indigenous population is blond, the Letto-Lithuanians having 83 percent, and the White Russians 76 percent of fair-haired individuals, the Jews show only 14 percent of such persons. In Roumania we find an exception: 14.67 percent of the Jews had fair hair, as against only 6 percent among the Roumanians. Fair eyes are also more frequent among the non-Jewish populations of eastern Europe than among the Jews, as can be seen from Table XLVI; even in Lithuania, where the indigenous population has over 80 percent of fair-eyed individuals, the Jews have only 37 percent. It is significant that in

countries where the percentage of fair-eyed persons is smaller than in Lithuania, the Jews, on the contrary, have proportionately more fair-eyed persons. Thus, in Galicia, where 39 percent of the Ruthenians and 70 percent of the Poles have fair eyes, the Jews have 47 percent, and in Russian Poland the Jews have 43 percent as against 81 percent among the Poles. We can consequently not find any relation between the color of the hair and eyes of the Jews and the non-Jewish populations among which they haved lived. It seems rather that the contrary is true. The Jews have almost everywhere about 80 percent of persons with dark hair and about 50 percent with dark eyes, about 15 percent with fair hair and over 40 percent with fair eyes. The fact that the indigenous population of a country is fairer or darker does not appear to affect the Jews. This is significant when considered in connection with the fact that

TABLE XLVI

COLOR OF THE HAIR AND EYES OF JEWS AND GENTILES IN EASTERN EUROPE

Country and Race.	No. Obs'd.	Hair.			Eyes.		Observer.
		Dark.	Fair.	Red.	Dark.	Fair.	
Galicia.							
Men. Jews	1,248	75.80	20.03	4.17	52.12	47.88	Majer & K., Fishb.
Men. Poles	4,057	54.90	44.00	1.10	29.40	70.60	" "
Men. Ruthenians	1,356	54.20	45.80	1.40	24.90	75.10	" "
Women. Jews	122	75.41	19.67	4.92	56.56	43.44	Fishberg.
Women. Poles	214	57.80	41.30	0.90	32.71	67.29	Majer & K.
Women. Ruthenians	133	69.90	30.10	—	45.87	54.13	" "
Poland.							
Men. Jews	503	89.86	7.16	2.98	56.11	43.89	Fishberg, Elkind.
Men. Poles	226	78.37	21.62	—	18.60	81.40	Elkind.
Women. Jews	181	87.29	7.73	4.98	56.91	43.09	Elkind, Fishberg.
Women. Poles	149	74.50	22.82	2.68	29.50	70.50	Elkind.
Lithuania and White Russia.							
Men. Jews	589	83.70	14.09	2.21	62.82	37.18	Fish., Yak., T.-H.
Men. Let.-Lithuan.	476	16.40	83.60	0.40	13.90	86.10	Talko-Hryn'z.
Men. White Russ.	961	23.30	67.70	1.00	25.40	74.60	" "
Little-Russia.							
Men. Jews	1,088	78.31	17.74	3.95	46.32	53.68	Talko-Hr., Fishb.
Men. Little Russ.	2,619	52.90	45.80	1.20	25.40	74.50	" " "
Women. Jews	873	83.39	13.63	2.98	61.63	38.37	" " "
Women. Little Russ.	647	64.40	33.20	2.30	42.60	57.30	" "
Roumania.							
Men. Jews	150	83.33	14.67	2.00	48.67	51.33	Fishberg.
Men. Roumanians	180	92.03	6.00	1.70	64.80	35.20	Pittard.

many other somatic characteristics of the Jews, such as stature and head-form, do greatly correspond to the type of their non-Jewish neighbors.

Typical representatives of a race show a constant interrelation between the color of their hair and that of their eyes; for example, in the blond northern races their light hair is usually accompanied by blue eyes. Individuals who do not exhibit such interrelation, having dark eyes with fair hair, or the reverse, are considered as "mixed types." From the figures in the preceding tables we find that in men 86.89 percent had dark hair (including red in this group) and 55.05 percent had dark eyes. It would therefore be expected that the combination of dark hair and dark eyes in the same individuals should occur according to the formula $88.89 \times 55.05 \div 100 = 47.83$ percent of the individuals observed. Fair types would be expected on the same principle to occur in $(13.11 \times 44.95 \div 100 =)$ 5.89 percent of Jews. In Jewesses these figures are expected to be 52.18 percent of brunettes and 5.85 percent of blonds. Empirically, however, we found these types to be distributed in the following proportions:

TABLE XLVII

TYPES OF PIGMENTATION IN 4,235 JEWS

Type.	Jews.		Jewesses.	
	Number.	Percent.	Number.	Percent.
Brunette	1,495	52.62	865	56.94
Blond	283	10.42	156	10.27
Mixed	1,004	36.96	496	32.79
Total	2,716	100.00	1,519	100.00

From this table we find that in 52.62 percent of all Jews observed both hair and eyes were dark; the combination of fair hair and eyes was observed in 10.42 percent of Jews and 10.27 percent of Jewesses. The brunette type, which is considered characteristic of the Jews, is thus reduced to only 52 percent in the contemporaneous Jews and to 57 percent in the modern Jewesses. But when we recall that other races of

Europe show even a smaller percentage of their racial type combination, we are not surprised. In Germany, among 6,000-000 school children only 31.80 percent had both blond hair and blue eyes, while of the 75,377 Jewish children 42 percent were of the pure brunette type.[1] In Austria Schimmer has found that of the non-Jewish children 19.79 percent were of pure blond type and 23.17 percent of the brunette type, while Jewish school children showed a percentage of from 32 to 47 of pure brunettes, according to the province, and from 8 to 14 percent of pure blonds.[2] That the Jews have apparently not preserved themselves free from intermixture can be seen from the number of mixed types found among them — 37 percent of Jews and 33 percent of Jewesses had dark hair with light eyes, or the reverse. Weissenberg[3] found 27.9 percent of mixed types; Yakowenko[4] observed 67.31 percent, and Majer and Kopernicki 61 percent,[5] while Talko-Hryncewicz[6] records even 74.3 percent of mixed types among 869 Jews in Little Russia, and in Poland there were 41.53 percent according to Elkind.[7] In addition, the great number of individuals with blond or light-chestnut hair, irrespective of association with light or dark eyes, which reached 13.11 percent in men and even 15.21 percent in women in New York City, also indicate foreign intermixture, and the same can be seen from the number of blue and gray eyes, amounting to 44.95 percent in Jews and 38.45 percent in Jewesses. All this again points to racial intermixture.

That we can get no clue as to the origin of these mixed types by a consideration of the color of the hair and eyes of the Jews in different countries we have already seen. The Jews are not

[1] Virchow, "Gesamtbericht über die Farbe der Haut, der Haare, und der Augen," etc., *Archiv für Anthropologie*, XVI, p. 298.

[2] G. A. Schimmer, "Erhebungen über die Farbe der Augen, der Haare, und der Haut, bei den Schulkindern Oestreichs," *Mittheilungen der Anthropologischen Gesellschaft in Wien*, Suppl., 1884.

[3] *Loc. cit.*, p. 107.

[4] *Loc. cit.*, p. 45.

[5] Majer and Kopernicki, "Charakterystyka, fizyczna ludnosci galicyjskiej," *Zbior Wiadomosci do antropologii Krajowej*, Vol. I, p. 111, Krakow, 1877.

[6] *Loc. cit.*, p. 45.

[7] *Loc. cit.*, p. 39.

necessarily more blond in countries where the indigenous population is blond; rather the reverse is true. A study of the interrelation of the color of the hair and eyes by types gives the same results, as can be seen from the following table:

TABLE XLVIII

TYPES OF PIGMENTATION OF JEWS IN VARIOUS COUNTRIES

Nativity.	Type.			No. Obsd.	Observer.
	Dark.	Fair.	Mixed.		
Galician Jews.					
Men, in New York	43.93	13.12	42.95	305	
Women, in New York	50.82	16.39	32.79	122	
Polish Jews.					
Men, in New York	53.65	9.52	36.83	315	
Women, in New York	50.00	5.36	44.64	56	
Men, in Poland	57.92	0.55	41.53	183	Elkind.
Women, in Poland	58.50	8.50	33.00	118	"
Lithuanian, White-Russ. Jews.					
Men, in New York	53.09	8.73	38.18	275	
Women, in New York	53.00	12.00	35.00	100	[Hr'z.
Men, in Lithuania	63.06	10.19	26.75	314	Yakowenko, Talko-
Women, in Lithuania	74.00	6.00	20.00	100	Yakowenko.
Little-Russian Jews.					
Men, in New York	49.31	7.31	43.38	219	
Women, in New York	55.41	8.11	36.49	74	
Men, in Little Russia	51.30	16.20	34.00	869	Talko-Hryncewicz.
Women, in Little Russia	68.60	6.90	24.30	799	" "
Roumanian Jews.					
Men, in New York	46.67	10.66	42.67	150	
Women, in New York	50.00	13.64	36.36	44	
Hungarian Jews.					
Men, in New York	45.71	12.14	42.15	140	
Women, in New York	61.54	5.13	33.33	39	
United States.					
Men, in New York	50.81	8.87	40.32	124	

From this table it is seen that the proportion of dark types oscillates between 44 percent (Galician) and 53 percent (Polish and Lithuanian Jews). Fair types were encountered 7.31 percent among the Little-Russian, 8.73 among the Lithuanian and White-Russian, 9.52 among the Polish, 10.66 among the Roumanian, 12.14 among the Hungarian, and 13.12 percent among the Galician Jews. A comparison with the Jews in their native

countries does not reveal any process of selection of fair types among the immigrants, as can be seen from Table XLVIII. Excepting the Polish Jews, those observed in eastern Europe have a larger proportion of blonds than those who emigrated to the United States.

TABLE XLIX

TYPES OF PIGMENTATION AMONG JEWS AND NON-JEWS IN EASTERN EUROPE

Country and Race.	No. Obs'd.	Type.			Observer.
		Dark.	Fair.	Mixed.	
Poland.					
Jews, men	275	55.22	6.23	38.55	Elkind, Fishberg.
" women	174	55.75	7.47	36.78	" "
Poles, men	226	17.57	20.27	62.16	Elkind.
" women	149	25.50	20.81	53.69	"
Lithuania and White Russia.					
Jews, men	589	58.41	9.51	32.08	[Fishb. Yakowenko, Talko,
" women	200	63.50	9.00	27.50	Yakowenko, Fishb.
Letto-Lithuanians, men	476	5.00	66.60	28.40	Talko-Hryncewicz.
White Russians, men	961	11.50	57.10	31.30	" "
" " women	275	21.09	58.55	20.36	Shtchedrobitzki (Ivanovski)
Little Russia.					
Jews, men	1,088	51.84	14.43	33.73	Talko-H'z, Fishb.
" women	873	67.69	6.99	25.32	" " "
Little Russians, men	2,619	20.40	34.00	45.60	" "
" " women	647	24.70	36.90	38.30	" "

A comparison of the Jews with the races and peoples in eastern Europe among which they have lived shows that the proportion of fair types among the Jews does not depend upon the frequency in which these types are encountered among the non-Jews. From Table XLIX it is evident that even in Lithuania and White Russia, where the indigenous population has up to 66 percent of persons with fair hair and eyes combined in the same individuals, the Jews have only 9.51 percent of such persons, while in Little Russia, where the indigenous population is darker, having only 34 percent of the fair type, the Jews have a much larger percentage of the fair type — 14.43 percent.

This condition has already been observed to be true of the German, Austrian, and Hungarian Jews. In his investigation of the color of the skin, eyes, and hair of the school children in Germany, Virchow found the proportion of brunettes to be

larger in the provinces where the non-Jewish population is fairer. This can be seen from the following table taken from Virchow's work:

Province.	Blonds.		Brunettes.	
	Jews.	Christians.	Jews.	Christians.
Prussia	11.23	39.75	43.34	9.29
Hessen	11.17	31.53	41.50	13.22
Baden	10.32	24.34	41.95	21.18
Bavaria	10.38	20.36	39.45	21.10
Alsace-Lorraine	13.51	18.44	34.59	25.21

These figures show in a striking manner that in Prussia, where the proportion of brunettes is smallest among the Christian population, only 9.29 percent, the Jews have 43.34 percent of brunettes, the highest percentage; while in Alsace-Lorraine and Bavaria, where the Christians have 25.21 and 21.1 percent respectively of brunettes, the Jews have 34.59 and 39.45 percent of such persons. A consideration of the color of the eyes of the school children in Germany gives the same results:

	Percent of Fair Eyes.		Percent of Dark Eyes.	
	Jews.	Christians.	Jews.	Christians.
Prussia	18.7	43.0	53.5	24.3
Bavaria	20.0	29.0	49.0	49.0

Where the proportion of fair eyes among the Christians is large, as in Prussia, the Jews have only 18.7 percent, while in Bavaria, where only 29 percent of the non-Jewish children had fair eyes, the Jewish had 20 percent. This is more strikingly confirmed by considering the distribution of the pure blond and brunette types among the Jews in Germany and Austria from Virchow's and Schimmer's works.

Germany.			Austria.		
	Pure Blonds.	Pure Brunettes.		Pure Blonds.	Pure Brunettes.
Silesia	8.20	49.53	Bohemia	8.29	46.87
Pomerania	8.85	50.58	Lower Austria	8.69	46.16
Brandenburgh	9.64	47.39	Moravia	9.86	43.15
East and West Prussia	11.61	43.04	Bukowina	13.55	35.21
Posen	12.39	39.22	Galicia	13.97	32.91

It is evident from these figures that the farther we go south and east of Europe, the smaller the proportion of brunettes among the Jews and the larger the proportion of blonds. With the non-Jewish population of this region the reverse is the case, as is graphically shown by the maps prepared by Virchow and Ranke.[1] Most of the blonds are found in Prussia, Pomerania, Schleswig-Holstein, Hanover, Westphalia, etc., and the farther east we proceed, reaching Posen, Silesia, Bohemia, Moravia, Upper and Lower Austria, and finally Bukowina and Galicia, the percentage of pure blonds decreases and the brunettes increase in frequency. It is noteworthy, as has been pointed out by Virchow, that in localities where the Jews have lived for centuries in strict isolation from other races, owing to religious and social prejudices, and presumably have not intermarried with their Gentile neighbors, the proportion of blond types is larger than in the Prussian provinces where they are not socially isolated but on the contrary have entered into general social intercourse with the non-Jewish inhabitants. Here the largest proportion of brunette types is found among Jewish school children.

This fact, which is fully confirmed by our observations on the immigrant Jews in the United States, is of peculiar significance, particularly when considered in connection with the fact that other somatic traits of the Jews depend greatly on the characteristics of their non-Jewish neighbors.

The high percentage of red-haired Jews is interesting. Among the Jews in New York we found that 3.23 percent of the men and 3.95 percent of the women had red hair. Majer and Kopernicki, Weissenberg, and Talko-Hryncewicz find 4 percent of red-haired Jews, and indeed erythrism has been regarded as characteristic of Jews both in Europe and in the Orient. We find that the red hair, particularly the beard, is usually frizzly and nearly always accompanied by freckled skin. This erythrism appears not to be of recent origin; it was not unknown among the ancient Hebrews, for Esau was said to have been "red all

[1] *Der Mensch*, Vol. II, p. 290; reproduced in Ripley's "Races of Europe," p. 222.

over like a hairy garment."[1] The reference to David as "ruddy" is explained by the Targum as "red-haired." Jacobs[2] comments on this as showing that the Jews of the time when the Targum was written (about 600 A. D.) where not averse to regarding the typical Jewish king as rufous. Painters in the early centuries of this era represented Christ with light hair, and Mary Magdalene is almost always depicted as having light hair. Judas Iscariot is considered to have been a typical red-haired individual, although the New Testament makes no mention of it. Besides this it must be mentioned that in ancient Egyptian monuments the Canaanites are pictured as having red hair and red beards. The Edomites, if we may trust the etymology of the word "edom," were also red-haired. The red hair of the modern Jews is thus considered by many archeologists to be derived from the ancient red-haired individuals and races in Palestine in ancient times.

The hair of the beard in men is usually lighter than that of the head, and red beards are more frequent than red heads. Observations on the color of the beards of 587 Jews show the following distribution:

Color.	Number.	Percent.
Black	175	29.82
Brown	118	20.10
Chestnut	81	13.80
Light chestnut	34	5.79
Blond	115	19.59
Red	164	10.90
Total	587	100.00

From these figures we find that red hair is nearly three times as common in the beard as on the head. This is not at all surprising to any one who has observed the Jews closely, for the beard is quite frequently red and very often has at least a rufous tinge of frizzly character. I find that red beards are more frequently found among the Jews of Galicia than among those of other countries. Besides the red beards we find from

[1] Genesis, XXV, 25.

[2] *Journal Anthropological Institute*, XV, pp. 23–62.

the table that 25.38 percent of Jews had fair-colored beards, nearly double the proportion of those with fair heads.

We have distinguished four varieties of hair: (1) Smooth (*Schlicht* in German, *droit* in French); (2) Wavy (*wellig* in German, *ondé* in French); (3) Frizzly (*lockig* in German, *frisé* in French); (4) Woolly (*kraus* in German, *crépu* in French). Observations on 867 men showed the following distribution in the varieties of hair:

Smooth hair	582 = 66.97 percent.
Wavy hair	223 = 25.66 percent.
Frizzly hair	55 = 6.33 percent.
Woolly hair	9 = 1.04 percent.

Weissenberg found 88 percent of smooth, 14 percent of wavy, and 2 percent of frizzly hair. From our own figures it is seen that 93 percent of the hair of Jews is either smooth or wavy, and that frizzly hair is rare (6.33 percent). Weissenberg[1] found only two curly-haired Jews among 100, and Major and Kopernicki[2] found only one curly-haired individual in 118, or 0.84 percent. Yakowenko[3] found four percent with curly hair, and Glück states that among the Spagnuoli he observed as much as 47.1 percent of curly and frizzly hair.[4] In Weisbach's study of the Jews of the Balkan peninsula, there are recorded 10 in 19 as having curly hair.[5] These last are of course rather a too high proportion, not borne out by any other investigation, and the only way in which it can be explained is that it is due to chance, owing to the small number of individuals observed (55 by Glück, and 19 by Weisbach), or to judging the variety by the appearance of the beard which in Jews is very frequently frizzly; indeed the rufous beards are almost always frizzly, and the black are often of the same character. We have emphasized this characteristic smoothness of the hair in the

[1] *Loc. cit.*, p. 103.

[2] *Loc. cit.*, p. 115.

[3] *Loc. cit.*, p. 153.

[4] L. Glück, "Beiträge zur physischen Anthropologie der Spaniolen," *Wissenschaftliche Mittheilungen aus Bosnien und der Hercegovina*, Vol. IV, pp. 587–592.

[5] A. Weisbach, "Körpermessungen Verschiedener Menschenrassen," *Zeitschrift für Ethnologie*, Ergänzungsband, 1877, pp. 212–225.

modern Jews, because of the fact that many of the contemporaneous non-Jewish Semites are known by their frizzly and woolly hair as much as by any other somatic characteristic.

Pigmentation undergoes changes with advance in the age of the individual. Grayness, or *canities*, may be premature or senile. Up to the age of 35 or 40 years the hair retains its normal color with most people. If grayness occurs before that time, it is considered premature; otherwise it is considered to be normal or senile. We have noted grayness in 161 individuals over 20 years of age, being 18.52 percent of the total 867. The youngest individual with gray hair was 22 years of age; the oldest retaining the natural color of his hair was 46 years of age. Weissenberg thinks that grayness appears quite early in Jews, while Yakowenko shows that it appears rather late, or about the age of 45 years. From our own observations we do not think that the Jews show any marked differences in this respect from other civilized peoples. Of the 161 gray-haired individuals examined, only 28 were younger than 35, a proportion which can not be regarded as abnormal.

Baldness, or alopecia, due to arrested development of the pilary system, is another change in the hair which appears with advanced age. It normally appears at about the age of 45 years, when other signs of decay become manifest, as grayness, loosening or decay of the teeth, diminution in the keenness of sight, etc.; under these circumstances it is called *alopecia senilis*. On the other hand, *alopecia prematura* takes place at an earlier age, and is more frequent in brain workers and in those leading sedentary occupations or exposed to prolonged mental worry. Many writers have stated that this change takes place earlier in Jews than in non-Jews. Weissenberg[1] has found that 16 percent of Jews between the ages of 21 and 50 years presented more or less baldness, the youngest showing this change being 23 years of age. Yakowenko,[2] on the other hand, shows that baldness is exceptional in Jews younger than 46 years, and when it occurs before this age it is usually due to favus. From

[1] *Loc. cit.*, p. 103.
[2] *Loc. cit.*, p. 32.

our investigations we are inclined to agree with Yakowenko. Excluding alopecia due to favus we have found 83 individuals with more or less baldness among 1,188 over 20 years of age. The youngest was 26 years. Only 12 individuals younger than 40 were affected with baldness.

Freckles (*ephelides*) was noted in all the red-haired individuals, and those having swarthy skin are also very often affected with freckles. Of 74 men and 62 women with light hair observed, only 4 men and 2 women were freckled.

CHAPTER VIII

The Combination of Traits Into Types

The North European (or so-called "Aryan") type, *i. e.*, the combination of blond hair, blue eyes, tall stature, and dolichocephaly, is not observable among the Jews. Taking up first the relation of stature to the shape of the head, we find that tall individuals are not more long-headed than those of short stature. In fact there is no difference at all in the headform according to stature, as can be seen from the following figures:

Stature.	Average Width of Head.	Average Length of Head.	Cephalic Index.
Short	153	186	82.26
Below the average	154	187	82.35
Above the average	154	188	81.91
Tall	156	190	82.11
Average	154	188	81.91

In the same manner the headform and pigmentation do not show any relation between long-headedness and blondness. It was found that the average cephalic index of 86 blond individuals was 81.35, and of the dark-haired Jews, 81.97, almost identical. The various types of headform were found in blonds and others in the following proportions:

Type of Head.	Blond-haired Jews (percent).	Others (percent).
Hyperdolichocephalic	3.49	2.84
Dolichocephalic	5.81	7.42
Subdolicocephalic	8.14	15.88
Mesocephalic	33.72	25.31
Subbrachycephalic	20.93	24.20
Brachycephalic	20.93	15.81
Hyperbrachycephalic	6.98	8.53
Number observed	86	1,442

From this table it is seen that 9.30 percent of the blonds were dolichocephalic (cephalic index 77 and less), while the dark-haired individuals had even a slightly larger percentage of

dolichocephalic — 10.26. Brachycephalic men (cephalic index 84 and upward) were found among the dark-haired to the extent of 24.34 percent, while among the blonds it was 27.91 percent. This does not confirm the observations of Majer and Kopernicki[1] who found that among the brunette Jews in Galicia 6.2 percent are dolichocephalic, as against 20 percent of the blond Jews being of this type of headform. This has often been quoted in support of the theory that the blond Jews have their origin in "Indo-Germanic" infusion.

The relation of the color of the eyes to headform may be seen from the following table:

TABLE L

COLOR OF EYES COMPARED WITH HEADFORM

Type of Headform.	Color of the Eyes.		
	Blue.	Gray.	Dark.
Hyperdolichocephalic	3.26	3.08	2.50
Dolichocephalic	7.69	7.20	7.61
Subdolichocephalic	12.13	14.65	16.98
Mesocephalic	26.63	24.17	26.34
Subbrachycephalic	24.26	24.94	23.35
Brachycephalic	18.93	14.14	15.73
Hyperbrachycephalic	7.10	11.82	7.94
Number observed	338	389	801

The average cephalic index was found in the

Blue-eyed individuals	81.43
Gray-eyed individuals	81.58
Dark-eyed individuals	81.96

which is almost identical in the three classes. From the above table we also see that the percentage of dolichocephalic Jews was among the blue-eyed, 10.95; in gray-eyed, 10.28, and in the black and brown-eyed, 10.21 — about the same in every group. Of brachycephaly we found among blue-eyed Jews, 26.03 percent; among gray-eyed, 25.96, and among dark-eyed, 23.22 percent. This again shows that the dark-eyed are like the dark-haired Jews — less brachycephalic than those with fair eyes.

[1] *Loc. cit.*, pt. I, p. 132.

The relation of pigmentation to stature has been studied by Pantukhof, who found that in Odessa, Russia, the Jews who had dark hair and eyes are of short stature, while those who have gray or blue eyes and fair hair are taller.[1] The same observer reports that among the Jews in Caucasia he found that those who are tall in stature have usually light eyes; those who have brown eyes were 161.7 cm. in height, while those who have blue or gray eyes averaged 164.4 cm.[2] On the other hand Ammon[3] found no relation between blond hair, blue eyes, and dolichocephaly among the Jewish recruits in Baden, Germany. Elkind reports the same of the Jews in Russian Poland, and finds that those who have dark hair and eyes are even taller than those with fair hair and eyes.[4] Our own measurements confirm this more strongly, because they are based on a larger number of observations.

Taking the relation of stature to pigmentation, we find no "Teutonic" or "Aryan" association:

Stature.	Blond Hair.	Dark Hair.
Short	22.09	23.37
Below the average	31.39	30.03
Above the average	25.59	27.60
Tall	20.93	19.00
Average stature	163.8	164.6

From these figures it is to be seen that the dark-haired Jews were taller, 164.6 cm. in height, than those who had blond hair, the latter averaging only 163.8 cm. in height. The proportion of tall and short people is about the same in both the blond-haired and in the dark-haired individuals. The same is seen from the figures on page 133, where the relation of the color of the eyes to stature is given. The average height of those having brown or black hair is 165.1 cm., as against only

[1] "Semitic Types," *Proc. Russian Anthropological Society*, pp. 26–30, St. Petersburg, 1889 (in Russian).

[2] *Idem.*, "Observations anthropologiques au Caucase" (in Russian), pp. 37–38, Tiflis, 1893.

[3] Otto Ammon, *Zur Anthropologie der Badener*, pp. 663, 664, Jena, 1899.

[4] D. N. Elkind, "The Jews," *Memoirs of the Soc. of Friends of Natural Science, Anthropol. and Ethnography* (in Russian) CIV, 1902, pp. 82–83.

163.8 of those who had blue or gray eyes. The proportion of tall individuals (over 165 cm. in height) is 48.44 percent among dark-eyed Jews and only 45 percent in those with light eyes. Short people (less than 165 cm. in height) are found only in the proportion of 51.56 percent among those with dark eyes, and reach 55.92 percent in those with blue eyes.

Stature.	Color of the Eyes.		
	Blue.	Gray.	Dark.
Short	22.78	25.44	22.47
Below the average	33.14	29.57	29.09
Above the average	26.33	25.45	28.97
Tall	17.75	19.54	19.47
Average stature	163.8	163.8	165.1
Number observed	338	389	801

From all these figures we find that the ideal "Aryan" combination of stature, pigmentation, and headform is not to be observed among the Jews. On the contrary, the rule among them appears to be that the tall people have darker hair and eyes, and have a lower percentage of dolichocephalic individuals; and that those who are short of stature are of fairer complexion, and show a larger percentage of dolichocephalic persons. This tends to exclude the "Aryan" influence as a cause of blondness in Jews, but it must be emphasized that this condition does not by any means exclude Slavonic infusion, for it has been observed that among the various Slavonic peoples tallness of stature is often combined with dark hair, and shortness of stature with blond hair. This is the case, according to Weisbach's researches, with the Serbo-Croats.[1] Among the Poles also the brunettes are taller than the blonds;[2] also among the White Russians[3] and the Great Russians.[4] Vorob'eff concludes that among many Slavonic peoples, such as the Serbo-Croats,

[1] A. Weisbach, "Die Serbo-kroaten der adriatischen Küstenländer," *Zeitschrift fur Ethnologie*, 1884, Supplement.

[2] Elkind, *loc. cit.*, pp. 363–364.

[3] E. R. Eicholtz, "Materials for the Anthropology of the White Russians" (in Russian), St. Petersburg, 1896.

[4] V. V. Vorob'eff, "Materials for the Anthropology of the Great-Russian Population," etc., *Memoirs Anthropological Section*, Vol. XIX, 1899, pp. 59, Moscow (in Russian).

Czechs, Poles, Ruthenians, Little Russians, White Russians, etc., the rule is, the larger the percentage of brunettes having dark hair and eyes, the larger the proportion of tall and round-headed individuals.[5] A glance at the ingenious maps prepared by Ripley[1] showing stature and cephalic index in eastern Europe, confirms this distinctly. The Slovaks, Little Russians, Serbo-Croats, Servians, etc., are taller, and also more brachycephalic than the Poles, Great Russians, etc. Another confirmation of this view is to be found among Great Russians in Transbaikalia, Siberia, who emigrated thither in the seventeenth century and are considered to have preserved their Slavic type more free from intermixture. They are taller and also more brachycephalic than their brethren in European Russia.[2]

All this evidence shows that the "Slavonic type" does not at all agree with the so-called "North European" or "Aryan" type, in which fair complexion is combined with tall stature and dolichocephaly, but that the reverse appears to be true — tall stature is combined with wide heads and brunettes, and the reverse. We may consequently look for the cause of the blondness among twelve percent of the modern Jews as possibly due to Slavic intermixture. From all available data we find that the interrelation of stature, pigmentation, and headform are similar to those which are normal in the Slavic populations among which these Jews have lived for centuries.

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[1] V. V. Vorob'eff, "On the Study of the Anthropology of the Slavic Population of Russia," *Russian Anthropological Journal*, 1902, No. 2, p. 106; and also "The Great-Russians," *ibid.*, 1900, No. 1, pp. 43–82.

[6] "The Races of Europe," pp. 340 and 350.

[2] J. D. Talko-Hryncewicz, "The Anthropology of the Great-Russians of Transbaikalia," Tomsk, 1898 (in Russian).

CHAPTER IX

Conclusion

As was stated in the introduction, the most important problem presented by the study of the physical anthropology of the Jews is whether they have maintained their racial purity during centuries of dispersion in various parts of the world. It would be desirable in this connection to compare the physical traits of the modern Jews with those of the ancient Hebrews, which is at present impossible. The ancient Hebrews have not embalmed their dead, and consequently no skeletons have been found thus far in Palestine dating back to the period of the Jewish reign in that country. One thing is certain, however: the original stock of the Jews was not made up of a single and homogeneous race, as is supposed by some. There are many references in the Bible to intermarriages of the ancient Hebrews with other non-Jewish races, as the Hittites, Amorites, Cushites, Canaanites, etc. That some of these races were not of Semitic stock has been established recently by archeological research. The Amorites, for instance, are believed to have been "Aryans," tall, blond, and dolichocephalic; and a considerable amount of evidence has been brought forward in support of this theory.[1] The Hittites are considered by some to have been a Mongoloid race, by others brunette brachycephals of the so-called Armenoid type.[2] The Cushites, according to Biblical and other evidence, were Negroes.[3] The ancient Hebrew patriarchs and the aristocracy of Israel have freely indulged in intermarriage with these and other non-Jewish races, and it can safely be assumed

[1] See A. H. Sayce, "The Races of the Old Testament," London, 1891; also Luschan, *loc. cit.*

[2] See M. Alsberg, "Rassenmischung im Judenthum," Hamburg, 1891. Luschan, *loc. cit.* Sayce, *loc. cit.*

[3] May the negroid traits such as dark skin, thick lips, prognathism, woolly hair, etc., which are often met with among the modern Jews, not be cases of atavism?

that the common people followed the example. All this shows that the Jews, even during the most glorious period of their history, cannot be considered to have been a pure race, free from foreign blood in their veins.

A comparison of the Jews with the living non-Jewish Semitic tribes shows that they belong to totally different races of mankind. The Bedouin Arabs, who are said, to have preserved themselves in the purest state, are of a type totally different to that of the modern Jews. They are of dark complexion, and it is very rare to find an Arabian with fair skin, blond hair, and blue eyes. They are above the ordinary stature, averaging 166 to 168 cm. in height. Their headform is distinctly dolichocephalic, with an average cephalic index of 73 to 77. All this shows that the modern non-Jewish Semites are of distinct African type. The Jews, on the other hand, are of Asiatic type, short of stature, brachycephalic, and in addition present a large proportion of blonds. In fact if the Bedouins are considered the standard Semitic type, then the Jews are not Semites at all. All the measurements taken on modern Jews tend to prove that physically they possess traits akin to those presented by the races and peoples among which they have lived during the last thousand years. The Jews are taller than in countries where the non-Jewish population is tall, and the reverse. In our study we found that stature is considerably influenced by environment, and by social and economic conditions. But the environment theory does not explain satisfactorily why the Jews in Bukowina are taller than those in Galicia, or why the Jews in Russian Poland are shorter than those in Little Russia. It is well known that economic and social conditions of the Jews in Bukowina are not superior to those in Galicia, or that in Little Russia the Jews are employed more often in outdoor occupations than in Russian Poland; nor is it known that the climate of Roumania, Little Russia, and Bukowina is especially favorable to growth of the body. The fact that almost everywhere the Jews are shorter by about two to three centimeters on the average than the Gentiles of the same country accounts to a certain extent for the effects of environment and

peculiarity of social conditions. It also proves that poverty, privation, and underfeeding could reduce their height only a few centimeters, but was not potent enough to deface the effects of race: it could not make the Jews in every country of about the same average height. It is therefore safe to explain these differences in stature of the Jews as caused by the infusion into their veins of non-Jewish blood. All the evidence available tends to exclude environment as the sole cause, and that intermarriage, open or clandestine, with non-Jews, accounts for the fact that the Jews in Little Russia, Bukowina, and Roumania, etc., are taller than those in Galicia, Poland, etc. They are taller in the countries named because the indigenous races in those countries (the Little Russians, Ruthenians, Roumanians, etc.) are taller. How far this holds good can be seen from Table VIII, showing the stature of the Jews in various eastern European countries, and in the diagrams showing the curves of these figures. It is also attested by the figures in the same table showing the distribution of the classes of stature among Jews and non-Jews. As long as it can not be conclusively shown that the Jews in Roumania and Little Russia are more often engaged in outdoor occupations, or are economically superior to those in Galicia and Poland, we will find the best explanation of the fact that the larger percentage of tall Jews in the former countries, and the larger percentage of short Jews in the latter, in the intermixture with the native races.

While the effects of environment are to be considered in speaking of stature, this is a negligible quantity in the case of the headform. Extensive craniological research has conclusively shown that the shape of the head depends only on race and heredity. Neither climate, nor social or economic conditions appear to have any influence on the cranial type. Wherever heterogeneity of the cephalic index has been found in a group of people, it was usually found that racial intermixture was the cause. As was shown in chapter IV, the type of head of the eastern European Jews is mesocephalic, about the same as that of the races and peoples of the countries in which they live. Wherever the head of the indigenous population is

broader, that of the Jews is also wider, and the reverse. When to this it is added that in Caucasia the Jews are hyperbrachycephalic and in northern Africa they are dolichocephalic, corresponding to the type found among the non-Jewish population, the reason for the diversity of type is apparent.

The headform of the ancient Hebrews is not known, because there are no crania available for measurement. The oldest Jewish skulls were measured by Lombroso.[1] They were found in the catacomb of Saint Calixtus in Rome, and date back to 150 A. D. The cranial indices of five of these skulls are 80, 76.1, 78, 83.4, and 75.1, which mean an average cephalic index in the living of 80.5. It is understood that no definite conclusions can be drawn from measurements of only five skulls, but the fact that among these are found not one dolichocephalic, and two brachycephalic skulls, points strongly against the opinion that the ancient Hebrews were a purely dolichocephalic race, corresponding to the type of the modern non-Jewish Semites. In this connection Luschan's theory is of interest. He suggests that the greater part of the ancient Hebrews were derived from the Hittites, a brachycephalic race which flourished in Syria and Asia Minor about 1500 B.C. Their decendants in modern times are shown by the same authority, and also by Jensen,[2] to be, besides the Jews, also the Armenians, the Turks, the Greeks, and others. Luschan points out that even the physiognomy of the modern Armenians, particularly the arched and aquiline nose, considered at present to be peculiarly Jewish, is in fact Armenian, and the same is true of other traits, such as pigmentation, etc. If this were true, then the Jews in the Caucasus are the ones who preserve the original type more than any other group, and those in other countries are the ones who diverted from the type. Not all the living Semites are dolichocephalic. Chantre shows that the contemporary Syrians of Semitic speech are often as brachycephalic as the Armenians. The same headform is characteristic of the Semites in the Caucasus, such as the Lesghians, Georgians, Aïsores, etc. Pan-

[1] "L'antisemitismo e le scienze moderne," Torino, 1894, appendix.
[2] "Hittiter und Armenier," p. 63.

tukhof shows that these races are of Semitic origin.[1] Considering that the Jews are not recent arrivals, but have been there from time immemorial, the form of skull of the ancient Hebrews may have been brachycephalic. In support of such a theory may be cited measurements of twelve skulls from a Jewish cemetery in Basle, Switzerland, dating back to the thirteenth and fourteenth centuries.[2] The average *cranial* index of these skulls is 84.66, *i. e.*, a *cephalic* index on the living of 86.66, which is about the same as that of the Jews in Caucasia. While twelve skulls are by far insufficient to lead to definite conclusions, the fact that not one of these skulls is dolichocephalic is of great significance. It tends to show that the headform of the Jews in Europe during the last few centuries has elongated, and not become rounder.

But no matter whether the original type of skull of the Jews was brachycephalic or dolichocephalic, the majority of the modern Jews in Europe are mesocephalic, as has been shown above. That intermarriage of races with different cranial types will produce a middle type has recently been disproved. The prevailing opinion at present is that intermarriage of long-headed with round-headed races does not produce middle types, but the continued coëxistence of both types. Professor Boas' studies of the North American Indians shows this to be true, and it was found to be the case also with the eastern European Jews.[3] The fact that the hyperbrachycephalic and dolichocephalic types of head are so infrequently found among the Jews in eastern Europe may be explained by the fact that intermarriage with the native races has, by a process of natural selection, eliminated these two types, giving place to the headform of the latter; and that the headform of the Jews does exactly correspond to that of their non-Jewish neighbors is good evidence in this direction.

[1] I. I. Pantukhof, "Observations anthropologiques au Caucase," and also "Les races du Caucase," Tiflis, 1900.

[2] J. Kollmann, "Schädel und Skeletreste aus einem Judenfriedhof des 13. and 14. Jahrhundert zu Basel." *Verhandl. der naturforschenden Gesellschaft*, Basel, 1885, VII, pp. 648-656.

[3] Franz Boas, "Heredity in Head Form," *American Anthropologist*, N. S., V, 1903, pp. 530-538.

The origin of the blond Jews is another problem which is of interest. Judging from Biblical tradition and the race portraits of the ancient Assyrian and Egyptian monuments, there were blond Jews in antiquity. At present over 10 percent of Jews have blond hair, and in some countries even 20 percent. Some believe that these blond Jews are the descendants of cross marriages of ancient Hebrews with Amorites. The fact that in Caucasia, where the indigenous population is dark, only 2 percent of the Jews have fair hair (Pantukhof), is against it; but it may be good evidence that in Caucasia the Jews, even had they intermarried with the indigenous races, could not acquire blond hair. The only possible objection that could be found against the opinion that the blond Jews in Europe are derived from intermarriage with North European races, is the fact, emphasized in Chapter VI, that they are more blond in countries where the indigenous population is darker, and the reverse. But it must be acknowledged that it makes very little difference where they have acquired it, as long as it is agreed that this blondness is one of the best proofs that they have not maintained themselves in as pure a state as is generally supposed. That it cannot entirely be ascribed to intermarriage with the Amorites and other fair races of Palestine in Biblical times, is attested by the fact that the modern Jewish blonds are not taller nor more dolichocephalic than the brunettes. Archeological research has shown that the blond Amorites were dolichocephalic and of tall stature; the Hebrews, compared with them were as "grasshoppers in their own sight."[1] The brunette Jews in eastern Europe correspond to the Slav type, being taller and having longer heads. This is normal among the Slavonians, such as the Poles, Czechs, Ruthenians, Little Russians, White Russians, etc., as has been shown in Chapter VIII. Nobody claims that the ancient Hebrews had come in contact with these races before their dispersion. This trait could have been acquired only while the Jews have lived among the Slavonians in eastern Europe, during the last ten centuries.

We conclude that the bulk of the modern Jews, who live at

[1] Numbers XIII, 33.

present in eastern Europe and who constitute more than 80 per-cent of all the Jews, are physically more akin to the races among which they have lived in eastern Europe than to the so-called Semites.

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TRIBES OF THE COLUMBIA VALLEY AND THE COAST OF WASHINGTON AND OREGON

BY

ALBERT BUELL LEWIS

CONTENTS

PAGE

Introduction 151
Culture Areas 152
Northwestern Oregon and Western Washington 153
Tribes 153
Head-deformation 154
Social Organization 155
Material Culture 156
Food 157
Shelter 159
Household Utensils 160
Transportation 163
Clothing and Ornaments 165
Weapons and Armor 169
Burial 170
Beliefs 171
Art 172
Southwestern Oregon 175
Willamette Valley 178
Southern Oregon 179
The Interior 179
Social Organization 179
Food and Manner of Life 180
Shelter 185
Household Utensils 186
Canoes 187
Clothing and Ornaments 187
Weapons and Armor 189
Burial 190
Art 190
Trade and Tribal Movements 192
Archeology 199
Mythology 199
Conclusion 202
Bibliography 204

TRIBES OF THE COLUMBIA VALLEY AND THE COAST OF WASHINGTON AND OREGON

By ALBERT BUELL LEWIS

Introduction

The Columbia River valley, ever since the graphic description of that region by Lewis and Clark, has been recognized as one of the most, if not the most, important line of communication between the native Indian population of the Pacific coast and the tribes of the interior portion of the continent. This area has also occupied a prominent position in certain theories regarding the origin and movements of peoples and cultures, of which that of Lewis H. Morgan is probably the best known. Nevertheless the native population of the region has never been thoroughly studied nor described, the most systematic work being that of Horatio Hale, which was limited largely to linguistics, and of George Gibbs. From the entire area of Oregon and Washington there are only a few collections, and most of these are modern, and represent a culture so influenced by changed conditions as to be of little value in an endeavor to understand and describe the original conditions. The object of this study is to try to bring together the more important facts known regarding the natives of this area, group them according to culture areas, and see if they throw any light on possible movements of peoples and cultures.

The most important general works referring to the natives of this region, in addition to those above mentioned, are the journals of Lewis and Clark, the early fur-trade literature, the narratives of the Wilkes Expedition, and of the Pacific Railway Surveys. Certain early travels, such as those by Kane, Lord, and Douglas, contain a number of items of importance. Vancouver's *Voyages* also contain a few references.

The reports of the Commissioner of Indian Affairs contain very little (except the Report for 1854, which contains the report of Gov. Isaac Stevens), and the same is true of the literature dealing with the early missionary work and settlement of the country. There are a few publications treating of limited areas and special topics, such as those of Swan, Eells, Gatschet, J. O. Dorsey, Boas, and Farrand.

It is not the intention to give in this general discussion all the references concerning any particular topic, nor to touch on all the facts known regarding these peoples, but only those which are to some extent at least susceptible of comparative study.

CULTURE AREAS

The culture of this region, especially along the coast, occupies an intermediate position between the more definite or extreme types of California and of the Northwest Pacific slope, and having few unique features of its own, is often spoken of as a mixture of the two. While it is undoubtedly true that many elements have been borrowed, it would seem better to regard the culture as in general of local development, influenced, modified, and in a sense directed not only by the physical environment, but also by neighboring cultures. To separate these elements, however, seems well-nigh impossible, with the exception of those more recently borrowed. These will be more fully indicated later. That certain tribes have immigrated into the region within relatively modern times seems clear from their linguistic affiliations; nevertheless the time of that migration was sufficiently far removed for their culture to have become so completely assimilated to that of their neighbors that, with our present knowledge, at least, their original culture cannot be detected. As we know very little of most of these tribes, it is possible that the assimilation is not so complete as now appears.

In the grouping of these peoples into certain culture areas, it must of course be recognized that the limits are not sharply marked, and that the cultures shade into each other more or less gradually. In some cases the boundary is fairly definite,

as between the tribes east and west of the Cascade range; in other cases it is so indefinite that the assigning of it to any particular location is to a large extent arbitrary, as is the case in locating the division line between the coast tribes of Washington and those of British Columbia. In some cases the difference would seem to be due principally to geographical conditions, making intercourse between the tribes difficult. In other cases it may be due to the character of the people at that particular time, as was probably the case with the Kalapuya of the Willamette valley. Recent movements of tribes to a different locality might also lead to the same result. The difference, which, however, is not very great, of the Makah of Cape Flattery from their immediate neighbors is probably due to this cause. It would be interesting to know, in such a case, how long it would take for the varying degrees of assimilation and acculturation to be brought about.

Within the territory of Oregon, Washington, and Idaho we may distinguish two principal culture areas, with from one to three minor areas. The latter, however, are but little known, and further information is necessary before they can be definitely classified. Of the two principal areas, one, that of the interior plateau culture, extends considerably beyond the region here under discussion; the other extends along the coast from about the mouth of Umpqua river northward to Puget sound and east to the Cascade mountains, not including, however, the valleys of Willamette and upper Umpqua rivers. While the Puget sound tribes are somewhat different from those on the Columbia, as will be brought out later in the discussion, for convenience they will all be treated together.

Northwestern Oregon and Western Washington

Tribes. — The culture of this area is typically represented by that of the Chinook of the lower Columbia, the best known tribe of the region, and may be called Columbian. Within this area there are a considerable number of tribes belonging to several linguistic stocks. These include the Salish tribes of the Washington coast and Puget sound region, with the Tilla-

mook of Oregon, the Chimakuan Indians of Washington, the Chinookan and Yakonan linguistic stocks, and the Athapascan Kwalhioqua and Tlatskanai who lived in the coast range north and south of Columbia river. Of these latter almost nothing is known, but they seem to have resembled their neighbors.[1] The culture of the Makah of Cape Flattery was practically identical with that of the Nootka, and has affected to some extent that of the neighboring tribes to the south.

Head-deformation.—The tribes of this region were especially bound together by one notable custom — that of flattening the heads of their children by pressure on the occipital and frontal regions, thus producing a broad, wedge-shaped cranium.[2] This practice also extended into neighboring areas, but there it was less in amount and usually limited to the women. Within the Columbian area the practice was universal, and no one could hope for social recognition whose head was normal in shape. It was a distinguishing characteristic, which marked these people off from all their neighbors, and all slaves were forbidden this privilege. All the "flatheads" regarded themselves as in a way one people, while those who did not flatten the head were fit only for slaves. Intermarriages between the various tribes were very common, being especially desired by and prevalent among the upper class.[3] Among the Chinook and their immediate neighbors individuals whose heads were flattened were rarely if ever kept as slaves, and while these tribes frequently made war upon each other in a more or less formal way,[4] their prisoners were not enslaved.[5] Slaves were obtained from outside tribes, usually by purchase, though with certain tribes, such as the Tillamook[6] to the south and the Makah[7] to the north,

[1] Hale, p. 204; Boas, (*a*) 1895, p. 588.

[2] For the distribution of this custom see Silas B. Smith, p. 255; Hale, p. 198; Gibbs, (*b*) pp. 211–2. The method is described by Swan, (*a*) pp. 167–8; Scouler, (*b*) pp. 304–5; compare also Boas, (*a*) 1890, pp. 647–8.

[3] Gibbs, (*b*) p. 197; Farrand, (*b*) p. 242; Eells, (*a*) pp. 655–6.

[4] Henry-Thompson, p. 855; Franchère, pp. 151–3; Cox, pp. 154–5; Gibbs, (*b*) pp. 190–1.

[5] For slavery among the Chinook and their neighbors, see Swan, (*a*) p. 166; Kane, p. 182; Ross, (*a*) p. 92; Franchère, p. 241; Silas B. Smith, p. 257.

[6] Lee and Frost, p. 103.

[7] Scouler, (*a*) p. 195.

slave-hunting raids seem to have been quite common. The tribes around Puget sound and the Yakonan Indians on the coast of Oregon, sometimes, as in case of poor people who were in debt, enslaved members of their own tribe.[1] This would seem to indicate that the rigid distinction made by the Chinook weakened toward the outskirts of the area, and that the lower Columbia was not only about the geographical center, but possibly also the place of origin of this particular method of head-deformation. It must be remembered that while certain tribes of British Columbia also deformed the head, the method was somewhat different from that practiced by the Chinook.[2]

This custom seems to have been a particular bond of union among the tribes of this region, and by means of the common practice of intermarriage among these tribes to have led to a certain similarity in physical type as well as in culture.[3]

The limits of this peculiar custom to the south seem to have been more definite than to the north, where it gradually changed to the methods practiced by the coast Salish of British Columbia. Among the Makah the flattening of the head was common, but was not practiced by all nor regarded as essential to social standing.[4]

Social Organization. — Information concerning the social organization is scanty and fragmentary. An hereditary nobility was everywhere present. There was probably also a middle class in the Puget sound region, where the giving of potlatches was prevalent.[5] On Columbia river and southward there is no indication of such a middle class, and it was possible for a

[1] Gibbs, (*b*) pp. 188–9 ; Farrand, (*b*) p. 242.

[2] Boas, (*a*) 1890, p. 647.

[3] See Silas B. Smith, pp. 255–6. Many of the early writers remark on the general similarity of these tribes, but their treatment of the physical characteristics is somewhat vague and contradictory. The investigation of Boas (*a*, 1891, pp. 424–449 ; *b*) tend to show that the tribes living on Columbia river were taller than those to the north and south, and that their nose was narrower and higher, in these respects approaching the interior tribes. In general it may be said that the variation in physical type along the coast was less marked and more gradual than that between the coast region and the interior.

[4] Swan, (*b*) p. 3.

[5] Compare Boas, (*a*) 1890, p. 570.

common man of wealth and standing to attain the rank of nobility or chief under certain conditions.[1] All ranks could keep slaves. There is no indication of a totemic or clan system. The village, frequently, if not usually, of individuals more or less related, seems to have been the social unit, though some chiefs united under their sway a number of villages. Otherwise the villages, even of the same tribe, were comparatively independent. Descent was in the paternal line. The chieftainship was nominally, at least, hereditary, and the chiefs possessed considerable power. The social organization, however, was relatively simple, and the complex conditions brought about by the clan organization and secret societies of the northern coast tribes were entirely lacking.[2]

The potlatch was practiced as far south as the Columbia,[3] but it does not seem to have been of much importance in that region, as none of the early writers mention the custom at all. Among the Puget sound tribes[4] it was quite common and of considerable importance; and here also we find a few secret societies with their masks and paraphernalia. The development of these societies, however, is slight compared with that among the Kwakiutl and other northern tribes, from whom they seem to have spread by way of the Nootka to some of the Puget sound tribes.[5]

Material Culture. — The material culture and manner of life of the coast tribes of Oregon and Washington correspond in general to their geographical surroundings. Agriculture was unknown. The dog was the only domestic animal. They depended on the natural products of the land and sea to supply their food and clothing. Having at hand an abundance of soft wood, such as the cedar, easily split and worked, we find them

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[1] Farrand, (*b*) p. 242; also information obtained from Mr Edward Sapir regarding the Wishram, a division of the Upper Chinook.

[2] The references to these points are largely incidental. See especially Farrand, (*b*) pp. 242–3; Ross, (*a*) p. 88; Cox, p. 154; Franchère, p. 250; Gibbs, (*b*) pp. 184–6.

[3] Boas, (*d*) pp. 268–9.

[4] Eells, (*a*) pp. 657–69; (*b*); Gibbs, (*b*) p. 205.

[5] Boas, (*a*) 1890, p. 578.

building houses of split and hewn planks, digging out huge wooden canoes, and carving bowls and household utensils of the same material. In all this they differed but little from their more northerly neighbors, who inhabited the same sort of region, yet in the working out of the details is seen the strong influence of local and inherited custom.

Food. — The sea furnished the chief means of sustenance [1] to those living along the coast. Game, especially the elk, and roots and berries were also important. Everywhere except among the Makah salmon was the staple food. Other fish, as halibut, sturgeon, cod, as well as shell-fish, were important locally. The Makah and their immediate neighbors, the Quileute, captured the whale; other tribes used only those that drifted ashore. Among the more interior tribes, fish, especially salmon, were still one of the principal foods, but roots, berries, and game occupied a more prominent position. Nuts and acorns also were eaten.[2] A number of different kinds of roots were used, the most important being camas, wapatoo (which was found especially in the lower Willamette valley), and the root of the common fern. This diversity of food materials caused the Indians to wander about considerably, according to the season, hunting berries or game in the mountains, gathering roots in the plains and swamps, and catching and curing fish at their favorite fishing places along the coast and rivers. Though the limits of the tribal territories were fairly definite and well known, the privilege of hunting, fishing, or gathering roots and berries seems to have been open to all friendly neighbors.

The methods of capturing fish and game practiced by the natives of this region were in general similar to those of their

[1] The best general discussion of food, with the methods of obtaining and preparing it, is given by Gibbs, (*b*) pp. 193–7. For the Makah see Swan, (*b*) pp. 19–30; for Indians of Puget sound, Eells, (*a*) pp. 621–2; (*c*), 1887, pp. 215–8; Wilkes, IV, p. 418; for coast tribes Swan, (*a*) pp. 82–91. The Journals of Lewis and Clark, as well as the reports of other travelers, contain numerous references to the food of natives of the regions through which they passed.

[2] Lewis and Clark, III, pp. 167, 173, 185; IV, p. 262; Boas, (*h*) p. 143; Lee and Frost, p. 181.

neighbors.[1] Game was killed with bow and arrows or caught in traps, snares, dead falls, or pits. Birds were shot with arrows or sometimes caught in nets stretched on poles. Fish were caught in large seines, or, if small and numerous, in scoop-nets, while the fish-rake was in common use on the sound.[2] They were also speared, caught on hooks, and gigged. On the rivers fish traps and weirs were used when possible, and fish were speared or caught in scoop-nets at the rapids and falls. The falls and cascades of the Columbia and the falls of the Willamette were especially noted as Indian fishing places.[3] The common digging stick, usually with a horn handle, was used for collecting roots.[4]

As regards apparatus and implements used in catching fish and game, the descriptions are too vague and scattering, and the specimens preserved too few to allow of any successful classification or comparison of types; but the general style was much the same throughout the area.

There seems to have been nothing distinctive in the method of preparing their food, aside from the numerous local taboos which had to be observed. Fish and game were usually boiled in baskets, boxes, or wooden troughs or bowls by means of hot stones. Roasting on spits by an open fire was also common. Roots were commonly baked by being placed in a pit over hot stones, on which water was thrown to cause steam, and then covered with grass and earth. Fish and game were sometimes cooked in much the same way.[5] Among the Upper Chinook acorns were also baked in the native "oven" with hot stones and then buried in deep pits near water, where they were left to soak for some time before being used.[6] Fish, roots, and berries were dried and preserved for future use. The method of drying fish varied with the kind and the locality. At the falls and

[1] In addition to references on foods, see Lewis and Clark, III, pp. 346–7; Eells, (*a*) pp. 633–5; Lord, vol. I.

[2] Wilkes, IV, p. 418; Eells, (*a*) p. 633.

[3] Wilkes, IV, pp. 345, 380, 384.

[4] Lewis and Clark, IV, p. 9.

[5] Ibid., IV, p. 132; Kane, p. 186.

[6] Lee and Frost, p. 181.

rapids of the Columbia great quantities of salmon were dried and pounded fine and then packed into baskets lined with fish-skin for preservation. Clark[1] says that each basket contained ninety to one hundred pounds, and that about thirty thousand pounds were annually prepared by the natives from a little above the falls to the Cascades inclusive. This dried salmon formed an extensive article of trade, both with the coast and the interior tribes.

Shelter. — During their summer peregrinations the natives lived in rush or bark lodges,[2] but in winter they inhabited permanent rectangular houses, built of timber and split planks.[3] These were sometimes as much as eighty to one hundred feet long by thirty to forty feet wide, and accommodated several families.[4] The floor was usually sunken three to five feet below the surface. While they differed somewhat in detail, they may be regarded as of the same general type as the wooden house found throughout all the heavily timbered region along the Northwest coast. The houses were sometimes square, but frequently much longer than wide, in which case they were often divided by partitions into two or more rooms.[5] The position and arrangement of the sleeping bunks or platforms, the places for storing provisions, the nature of the fireplace, doorway, smoke-hole, etc., varied somewhat from place to place. There was sometimes a second lower platform a few inches high in front of the main sleeping platform. The latter was from two to four feet above the floor, the space underneath being used for storing provisions and various articles. The houses were lined, especially in the winter, with rush mats. Mats were also placed on the platforms and ground for sleeping and sitting upon. Among the Chinook and neighboring tribes the houses had gable roofs, rather steep, which among the

[1] Lewis and Clark, III, p. 148.

[2] Ibid., IV, p. 223; Kane, p. 187.

[3] Lewis and Clark, III, pp. 154, 183, 208, 358; IV, pp. 222, 255, 259; Henry-Thompson, p. 804; Ross, (*a*) p. 98; Franchère, p. 247; Swan, (*a*) pp. 110–11, (*b*) pp. 4–7; Eells, (*a*) p. 624; Stevens, p. 243; Gibbs, (*b*) pp. 214–5.

[4] Franchère, p. 247.

[5] Lewis and Clark, III, p. 326; IV, p. 240; Parker, p. 179.

Upper Chinook were usually covered with bark,[1] but on the coast with boards. The planks forming the walls of the house were placed perpendicularly. On Puget sound the roof was flatter, and the walls of overlapping boards placed horizontally. Here the shed-roof seems to have been the prevailing type, the houses being the same as those of the Nootka and Coast Salish of British Columbia.[2] In this region they also frequently built extra large house for potlatches, festivals, and special occasions. Gibbs[3] mentions one 520 feet long, 60 feet wide, 15 feet high in front and 10 feet in the rear. Such special houses were occasionally built as far south as Shoalwater bay.

The entrance[4] to the dwelling house was merely a round or oval opening, two or three feet high and a foot or two above the ground, and was covered by a piece of board suspended loosely above the opening on the inside. In the larger houses there were usually two or more entrances, and when the houses were partitioned there was one for each division. The plank through which the opening passed was often painted or carved to represent an animal or human face or figure.[5] The timbers supporting the roof were also frequently carved and painted, the human figure being commonly represented.[6] Sweat-houses of the same type as those found in the interior were occasionally used by the Indians on Puget sound[7] and probably on the Columbia, but were not found along the coast. Their myths contain references to a larger kind of sweat-house heated directly by means of a fire or hot stones,[8] which seems to be similar to the Californian type.[9]

Household Utensils. — With household utensils[10] the people

[1] Lewis and Clark, III, p. 154; IV, p. 255, 259.
[2] Gibbs, (*b*) pp. 174, 215; compare Boas, (*a*) 1890, pp. 563–5.
[3] (*b*) p. 215.
[4] Lewis and Clark, III, p. 154; Swan, (*a*) p. 111.
[5] Lewis and Clark, IV, p. 198; Vancouver, II, p. 77.
[6] Lewis and Clark, IV, pp. 198, 215; Gibbs, (*b*) p. 215.
[7] Swan, (*a*) p. 180.
[8] Farrand and Kahnweiler, p. 104; Boas, (*d*) p. 58.
[9] Compare Kroeber, (*a*) p. 86.
[10] Lewis and Clark, III, pp. 353–4; Gibbs, (*b*) p. 220; Eells, (*a*) pp. 626–9; (*c*) 1886, pp. 40–1; Swan, (*a*) pp. 161–4; (*b*) pp. 42–3.

of this region were fairly well supplied. They had wooden bowls and troughs of various sizes, used for cooking and other purposes; wooden spoons, often with carved handles; spits for roasting meat and fish; watertight baskets from the size of a small cup up to several gallons' capacity, used for cooking, serving food, etc.; bags and less tightly constructed baskets of cedar-bark, rush, or grass, used for storing provisions; and mats of various sizes. Bowls made out of the horn of the mountain sheep and spoons of mountain-sheep or mountain-goat horn were more or less common throughout the region.[1] Some of these were obtained by trade from the north, while others were of local manufacture, as is shown by the style of decoration, which is similar to that found on the wooden bowls and spoons of this region, and quite different from the art of the northern tribes.

Boxes made out of boards, in much the same way as among the more northerly Indians, were manufactured by the natives around Puget sound. Henry[2] says that the Chinook in 1814 had wooden boxes with covers, some of which they made themselves, but does not tell how they were made. This is clearly an introduced article, and it is not likely that the Chinook in earlier days ever made boxes of this character.

For cooking purposes wooden bowls and boxes were used along the coast, while farther east toward the mountains baskets were more commonly used for this purpose. In the coastal region twined baskets only were made, while nearer the Cascade range coiled ware is also common.[3] In this region we find the peculiar imbricated coiled basketry, which is limited to the region immediately east and west of the Cascades in Washington and southern British Columbia. In Washington, especially the southern part, the round form predominates, while to the north the rectangular form, often with a lid, becomes

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[1] Kane, p. 185; Eells, (*c*) 1886, p. 40; Gibbs, (*b*) p. 220; Swan, (*a*) p. 163; Lewis and Clark, III, p. 273.

[2] Henry-Thompson, p. 789.

[3] For basketry see Mason, especially pp. 416–40; Swan, (*b*) p. 46; Eells, (*a*) p. 627. For explanation of the various types of baskets see Mason, pp. 221–59.

more common. As these forms are less suitable for coiled ware than the round, it would seem that the origin was probably in the southern part of this area, and that the more northerly tribes, while adopting the technique, modified the form to correspond to that of their wooden boxes or birch-bark baskets,[1] the coiled baskets being used largely for the same purposes. The adoption of this coiled ware by some of the most northerly tribes using it is known to be quite recent. Coiled ware was made in Oregon, but imbrication does not seem to have ever been practiced south of the Columbia.[2] The finest type of imbricated ware is said to have been made in the Cowlitz valley. As the earliest baskets known from that region are subsequent to the invasion of the valley by the Klikitat,[3] who were later also called Cowlitz, it might seem questionable whether this is due to Salish or Shahaptian influence. This particular type of basket, in fact, is commonly called Klikitat. The Klikitat, however, are probably later arrivals in this region. The baskets made by the Klikitat are also said to be coarser than the Salish ware.[4] It has been suggested that the making of coiled baskets may have been introduced at the time of the Athapascan migration.[5] However that may be, it would seem that the technique of imbrication has originated among the tribes living along the Cascades in Washington, whence it, together with the making of coiled ware, spread to the Salish tribes on the north.

Twined ware is found throughout the whole area, both in bags and baskets of different kinds. Owing to lack of material, the distribution of the different methods of applying the ornamental designs is doubtful. Probably several were used in the same area, as it is known that they made a great variety of bags and baskets. On the modern twined baskets and wallets of the Upper Chinook, the design is frequently formed by the

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[1] Suggested by Boas.

[2] Mason, p. 428.

[3] The Klikitat are a Shahaptian tribe; the true Cowlitz were Salish.

[4] Mason, p. 428.

[5] Boas in Teit, (*a*) p. 309.

wrapped twined method, two strands of different colors being used. Sometimes the design is applied by wrapping the colored element around both the twined elements. False embroidery also is used. All three of the above methods, according to Eells,[1] were used by the Puget sound Indians. These, together with the Makah, also made checkerwork and twilled baskets out of cedar-bark strips, similar to those used by the Indians to the north. Such baskets were used chiefly for storing provisions.[2] Twined baskets with crossed warp were also made by many of the tribes.

Mats were of considerable importance because of their great variety of uses, such as for temporary lodgings, lining and covering of canoes, lining of houses, for beds, for the serving of food, etc. The common sewed rush mat of the interior was used throughout all this area,[3] except among the Makah,[4] who make checkerwork mats of strips of cedar-bark. Checkerwork mats are also made by other tribes on Puget sound.[5]

Transportation. — As travel and transportation among the Indians of this region were largely by water, canoes formed an important part of their property. These varied very greatly in form and size, according to the purpose for which they were designed. The Chinook had five or six names for as many different varieties.[6] Probably some of these were made by other tribes, as canoes formed an important article of trade. The so-called "Chinook canoe," for example, was usually made on Vancouver island,[7] and is in fact a form earlier used by the Nootka, as described in 1778 by Cook.[8] It is one of the most common types on Puget sound.[9] This type of canoe, while

[1] Mason, p. 421.

[2] Eells, (*a*) p. 627.

[3] Gibbs, (*b*) p. 220; Eells, (*a*) pp. 626–7; Willoughby, Chas., p. 268; Franchère, p. 245. The method of manufacture is described in some detail by Swan, (*a*) pp. 161–2.

[4] Swan, (*b*) p. 45.

[5] Eells, (*a*) p. 626.

[6] Boas, information.

[7] Swan, (*b*) p. 31.

[8] II, p. 327.

[9] Boas, (*a*) 1889, p. 817; Gibbs, (*a*) p. 430.

common on the Columbia in later times,[1] does not seem to correspond to any of the types described by Lewis and Clark,[2] and the name given to it by the Chinook is of Salish origin.[3] Many of the various kind of canoes, especially the large war canoes, rapidly went out of use after the coming of the whites, and the descriptions are too meager to admit of very accurate comparison. The war or traveling canoes were the largest, being 40 to 50 feet long, with projecting bow and stern, often ornamented with paintings and carved human or animal figures.[4] Smaller canoes of several varieties were used on the interior waters,[5] and these were frequently made with a broad shovel-nosed bow for convenience in poling.[6] A large, wide, shovel-nosed canoe was also used on Puget sound for transportation.[7] All these canoes were made out of the trunk of a single tree, usually cedar. In the larger canoes the projecting bow and stern were of separate pieces, mortised in and fastened with cords. The gunwale was sometimes raised by an additional piece of wood or plank. The method of manufacture seems to have been everywhere much the same. The trees were cut down with stone axes or chisels, and the extra wood split off by means of wedges. The canoe[8] was first roughly shaped on the outside and then hollowed out by means of adzes or chisels. Swan[9] says fire was formerly used for this purpose. The Makah[10] used hatchets of stone and chisels of mussel-shell. Eells[11] says the Puget sound tribes formerly burnt out their canoes and finished them with hand adzes of stone.

The paddles used varied somewhat from tribe to tribe, in addi-

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[1] Gibbs, (*b*) p. 216.

[2] Lewis and Clark, IV, pp. 31, 35.

[3] Boas, information.

[4] Ibid., III, p. 197; IV, p. 32; Franchère, p. 246.

[5] Lewis and Clark, IV, p. 234; Gibbs, (*b*) p. 216.

[6] Swan, (*a*) p. 80.

[7] Gibbs, (*a*) p. 430.

[8] For method of making see Swan, (*a*) pp. 80–2; (*b*) pp. 35–7; Gibbs, (*b*) p. 218; Lewis and Clark, IV, p. 32.

[9] (*a*) p. 81.

[10] Swan, (*b*) p. 36.

[11] (*a*) p. 641.

tion to the fact that the man's paddle, woman's paddle, and steering paddle were all different. The paddle of the Chinook, Tillamook, and some neighboring tribes was notched or hollowed out at the end.[1] This seems to have been used on the rivers generally, and was especially adapted to shallow water or where punting became necessary. The deep-water paddle of the Coast Salish[2] and the Makah[3] had a long, slender point, while the common paddle of the Puget sound[4] tribes was more abruptly pointed.

Clothing and Ornaments. — The clothing[5] used by the natives of this area was relatively simple. The men either wore nothing at all or merely a robe or blanket thrown over the back and fastened across the chest with a string. The women wore a sort of petticoat made of twisted strings of cedar-bark or grass, occasionally of wool, fastened to a cord or band around the waist and falling to the knees. In addition to this they usually wore a robe, smaller than that worn by the men, over the back. Among the Yakonan a similar fringed garment was worn around the shoulders.[6] A hat, usually woven of cedar-bark and grass, was frequently worn, especially in wet weather, when it was also customary to throw a mat over the shoulders for further protection.

The hats of the Chinook and neighboring tribes[7] seem in the early days to have been largely of the type commonly known as Nootkan and recently described from old specimens by C. C. Willoughby. They were closely woven of cedar-bark and grass with some fine cedar-root, so as to be water-tight, and were of a conical shape, surmounted by a pointed knob some two to four inches in diameter. They were ornamented

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[1] Lewis and Clark, III, p. 326; Franchère, p. 246.

[2] Swan, (*a*) p. 80.

[3] Swan, (*b*) p. 21.

[4] Eells, (*a*) p. 642.

[5] Lewis and Clark, IV, p. 184; Gass, pp. 170, 204; Gibbs, (*b*) p. 219; Swan, (*a*) p. 155; (*b*) pp. 15–17; Eells (*a*), p. 630; Scouler, (*a*) p. 201; Ross, (*a*) pp. 89–91; Franchère, p. 242; Galiano, p. 30.

[6] Hines, p. 107.

[7] Lewis and Clark, III, p. 296; IV, p. 23; Ross, (*a*) p. 89.

with interwoven designs representing whaling scenes, animals such as dogs and deer, or purely geometrical figures. Comparison of the early accounts of the Nootka[1] with those of the Chinook seems to show that these hats were more prevalent among the latter than among the former. The Nootka usually wore another type of hat, shaped like a truncated cone and painted red or with designs. Jewitt says that the knobbed hat with interwoven designs in black and white, representing whale fishing, was worn only by the chief. Galiano notes that the designs always represent whale fishing, and that the hats of the common people lacked the design and the knob on top. As we know that the privilege of catching whales among the Nootka was limited to certain chiefs,[2] and jealously guarded by them, the use of this type of hat was probably limited in a similar manner. The only hat worn among the Makah, according to Swan,[3] was a somewhat rounded, slightly pointed hat woven of spruce roots and painted, frequently with designs; but Galiano's atlas contains a figure of the Makah chief wearing a typical "Nootka" hat with the whale-fishing design. This limitation of its use among the Nootka, together with the excellent technique and method of applying the ornamentation, which was overlaid, seems to point to a more southerly origin, probably the Salish or Chinookan tribes of the Washington coast. Hats or caps do not seem to have been much used by the Salish of Puget sound,[4] though Kane[5] says that in 1846, caps, made of grass of different colors, were much used by the women among the Nisqually. These may have been similar to those worn by the women among the interior tribes.

The robes and blankets used in this area were usually made of the skins of various animals, or woven (twined?) from the wool of the mountain goat. While these were more common northward, woolen robes were also made on the Columbia.[6]

[1] Cook, II, p. 304; Jewitt, pp. 67–8; Galiano, p. 127.
[2] Boas, (*a*) 1890, p. 585.
[3] (*b*) p. 45.
[4] Eells, (*a*) p. 630.
[5] P. 207.
[6] Lewis and Clark, IV, pp. 96, 185.

The Makah, Clallam, Songish, Lummi, and probably some other tribes of the Puget sound region also made blankets from the hair of a certain variety of dog, which they raised for that purpose.[1] This hair was usually mixed with the down of the wild goose or duck before being made into thread. The Makah also made twined blankets and capes of the bark of the yellow cedar,[2] similar to those of the Nootka. Throughout this area robes were frequently made of strips of the skin of various animals, such as the beaver, raccoon, sea-otter, etc., and also of strips of the skins of wild fowl. These strips were either twisted or simply allowed to dry; in the latter case they curled so as to bring the fur out, and were then woven or twined into blankets.[3] The strips of bird-skin were sometimes wrapped round a string to give them additional strength. This method seems to have been the same as that commonly used throughout the interior and in California, the fur strands being woven together by a double-twined weft of string.[4] Among the Chinook this kind of robe was worn principally by the women,[5] who also in cold weather sometimes made use of a sort of jacket of skins, dressed with the hair, fastened behind but not covering the arms.[6]

While the early descriptions are not very full, such seems to have been the general character of the clothing worn over the greater part of this area, especially along the coast. Farther inland there were certain modifications due to influence from the interior. Moccasins were sometimes worn, also shirts, leggings, and dresses of buckskin, especially where the tribes came in contact with those of the interior, as at The Dalles.[7] On the Columbia from the mouth of the Willamette up, we also find that the woman's cedar-bark petticoat is replaced by the buck-skin breech-clout of the interior.[8]

[1] Vancouver, I, pp. 230, 266; Kane, p. 210; Eells, (*a*) p. 630; Scouler, (*a*) p. 196; Stevens, p. 243; Boas, (*a*) 1890, pp. 566–7.]

[2] Swan, (*b*) p. 44; Stevens, p. 241.

[3] Lewis and Clark, IV, p. 190; Kane, p. 184; Swan, (*b*) p. 44.

[4] Compare Teit, (*a*) p. 190; Dixon, p. 148.

[5] Lewis and Clark, IV, p. 185.

[6] Ibid., p. 190.

[7] Ibid., pp. 280, 284.

[8] Ibid., pp. 214, 224.

The method of wearing the hair varied considerably from place to place and also with age and sex. On the coast the men seem generally to have worn their hair loose.[1] Lewis and Clark found that near the mouth of the Columbia the hair of both sexes was carefully parted in the middle and worn loose and flowing, while above the mouth of the Willamette the hair was braided, or in the case of men twined with thongs of skin, into two queues, similar to the style of the interior.[2]

Tattooing[3] occurs to but a slight extent among these tribes, and is usually limited to a few lines or dots on the arms or legs, apparently according to individual fancy. It is more prevalent among the women than the men. The face is rarely, if ever, marked.

Ornaments were commonly worn by both sexes, but especially by the women.[4] Nose and ear ornaments, necklaces, etc., were worn, though it is doubtful if nose ornaments were used by the tribes of Puget sound.[5] Most of these were made of shells, dentalia being the most valued. These form, in fact, one of their most valued possessions, and also serve as a circulating medium. Among the Chinook collars of bear's claws were sometimes worn by the men and ornaments of elk teeth by the women. Feather ornaments were also common among the Chinook. Broughton, the first to mention the Chinook, says of them in 1792: "The natives differed in nothing very materially from those we had visited during the summer [on Puget sound], but in the decoration of their persons. In this respect they surpassed all the other tribes, with paints of different colors, feathers and other ornaments."[6] Their myths mention feather head-ornaments,[7] also the use of the heads of red-headed woodpeckers[8] in decorating their bows. The use

[1] Swan, (*a*) p. 154; (*b*) p. 17.

[2] Ibid., pp. 184, 214, 269, 284.

[3] Ibid., III, p. 241; IV, pp. 186, 269; Swan, (*a*) p. 112; (*b*) p. 18.

[4] Owing to the rapid introduction of articles of trade, there is not much information regarding native ornaments. See Lewis and Clark, IV, p. 187; Swan, (*a*) p. 159; (*b*) p. 47; Eells, (*a*) p. 631.

[5] Vancouver (II, p. 232) says he saw none, and Eells makes no mention of any.

[6] Vancouver, II, p. 77.

[7] Boas, (*h*) p. 52.

[8] Boas, (*d*) p. 80.

of feather ornaments, especially the woodpecker heads, suggests a connection with the culture of northern California, where such feather ornaments were used to a large extent and woodpecker scalps regarded as a valuable possession.[1]

Weapons and Armor. — The weapons[2] seem to have been originally limited to the bow and arrow, and a war-club of wood, bone, or stone. The sinew-backed bow of the interior was common over most of the area.[3] The arrows were tipped with wood, bone, or stone, though stone points were rare north of the Columbia.[4] Lewis and Clark[5] say that the Chinook frequently used stone arrowpoints. A few years later these had been entirely replaced by iron. It is interesting to note here that one of the archeological finds of the Columbia valley, both above and below The Dalles, has been the discovery of great numbers of stone arrowpoints, remarkable for their small size and excellent workmanship. Stone arrowpoints are less frequently found about Puget sound, and are still rarer farther north.[6] The Chinook arrow also frequently had a foreshaft 4 to 5 inches long.[7] War-clubs made of the bone of the whale, usually with carved handles and decorated sides, were common on the coast, especially among the Makah, who were whale hunters. Such clubs were also occasionally traded to tribes farther inland, as specimens have been found on the Columbia and on Puget sound. No mention by the early writers of the use of stone clubs by the natives of this region has been seen, though Cook[8] mentions them as having been used by the Nootka. Four different types have been reported from archeological sites.[9] Whether these different types of stone clubs, some of which may have been ceremonial, were made or used by the historical inhabitants of this region, it is impossible to say, but it would

[1] Dixon, p. 149; Kroeber, (*a*) p. 88.
[2] Gibbs, (*b*) p. 192; Cox, pp. 154–5; Boas, (*h*) p. 27.
[3] Lewis and Clark, III, p. 346; Henry-Thompson, p. 808; Vancouver, I, p. 153.
[4] Swan, (*b*) p. 48, 49 note; Eells, (*a*) p. 633.
[5] III, p. 347.
[6] H. I. Smith, (*a*) p. 564.
[7] Lewis and Clark, III, p. 347; Henry-Thompson, p. 808; Schoolcraft, III, p. 34.
[8] II, p. 324.
[9] H. I. Smith, (*a*) p. 565, (*b*) p. 175.

seem possible that they were. Wooden clubs, some with carved handles, were found on the Columbia by Lewis and Clark, but at that time (1805) iron clubs or swords were common.[1] Even in 1792 Vancouver[2] found copper "swords" and "a kind of battle-axe made of iron" in use on the lower Columbia. Lewis and Clark also found in very common use among the Chinook a double-ended knife or dagger, evidently of iron, though they do not say so directly.[3] This is exactly the same type as that used by the Tlingit and other northern tribes, and may have been obtained directly from trading vessels at the mouth of the Columbia. The copper "sword" mentioned by Vancouver, however, as well as the iron battle-axes, must have come to the region by native traffic. The Upper Chinook, at least in the thirties, made use of the interior and plains type of war-club — a stone covered with hide and fastened to the end of a short wooden handle.[4]

Two kinds of armor[5] were used by the Chinook: one consisted of a sort of shirt or tunic of elk-hide, said to have been arrow-proof; the other was a kind of cuirass or vest made of sticks or strips of hard wood twined together. Shields seem to have been used occasionally.[6] Eells[7] says that the only armor he had heard of around Puget sound was of elk-skin, but it is probable that both types were known throughout the region, as their use is widespread among the interior and coast tribes from California to Alaska.[8]

Burial. — The methods of burial or disposal of the dead practiced throughout this area were much the same in general, though differing somewhat in detail among the different tribes.[9]

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[1] Lewis and Clark, III, p. 326; IV, pp. 215, 222.

[2] II, p. 61.

[3] Lewis and Clark, IV, p. 23.

[4] Lee and Frost, p. 178.

[5] Franchère, p. 253; Cox, pp. 154–5; Ross, (*a*) p. 89.

[6] Boas, (*h*) p. 27.

[7] (*a*) p. 633.

[8] See Hough.

[9] A good general description is given by Gibbs, (*b*) pp. 200–5. Other descriptions applying to particular places are found in Lewis and Clark, III, pp. 260, 324; Swan, (*a*) p. 186; Kane, pp. 202–3; Farrand, (*b*) p. 241; Vancouver, I, pp. 255–6; II, p. 54; Swan, (*b*) pp. 83–6; Eells, (*a*) pp. 669–72; Wilkes, IV, p. 479.

The method also varied with wealth and rank, little pains being taken with poor people, while the bodies of slaves were merely thrown out into the woods or left wherever it was convenient. Along the coast and on Puget sound the bodies of the more important members of the community were wrapped in mats and skins and placed in canoes (occasionally only in a box, sometimes in a box placed in a canoe), in and around which were deposited quantities of their former possessions, broken or "killed" according to the usual custom. Slaves were sometimes sacrificed. South of the Columbia the canoes were usually left on the ground,[1] while among the Lower Chinook and their neighbors to the north they were more commonly raised on a sort of scaffold made of poles or timbers and a second canoe inverted over the first. Among the Makah and the Puget sound tribes the boxes or canoes were commonly placed in trees. Burial in the earth does not seem to have been practiced, though sometimes the bones were gathered and buried in a box.[2]

On the Columbia river, above the mouth of the Willamette, a different method was practiced.[3] Here the dead, wrapped in mats and skins as usual, were laid in covered wooden "vaults" or burial houses. These were square, or nearly so, with sides and roof of planks, and were usually built on the surface of the ground. In them the bodies were laid with their heads to the west, sometimes piled up to a depth of three or four feet. Carved wooden images were frequently set up around the vaults, and the planks were often carved and painted to represent men or various animals.

Beliefs. — Our knowledge concerning the mourning customs, the beliefs concerning the future world and souls of the dead,[4] the treatment of and belief concerning disease, the acquiring of guardian spirits and practice of shamanism, etc., is very fragmentary,[5] but aside from minor details they seem to have been much the same in this area as in neighboring regions.

[1] Lewis and Clark, III, p. 323; Farrand, p. 241.

[2] Swan, (*a*) p. 186.

[3] Lewis and Clark, III, pp. 175, 178; IV, pp. 224, 270; Cox, p. 75.]

[4] Boas, (*c*); Farrand, (*b*) pp. 240–1.

[5] There are a number of scattered and incidental references to native practices in

Art. — The art of this region was by no means so highly developed as that farther north, and was, in part at least, of a different character. It found expression chiefly in carving, painting, and in decorative designs on bowls and baskets. The carving and painting of their canoes,[1] house fronts and posts,[2] grave vaults and images, have already been referred to. These all seem to have been realistic in character. In describing the interior of a Chinook house at the Cascades, Henry says: "The front planks of the beds are carved and painted in various styles. At the end of each range are some broad upright planks, on which figures are rudely carved, somewhat resembling fluted pillars. At the foot of the chief's bed are planted in the ground at equal distances four figures of human heads, about two feet high, adorned with a kind of crown, and rudely carved and painted. Beside these figures are erected in the ground two large, flat, painted stones. On the side of each partition, facing the fireplace, are carved and painted on the planks uncouth figures of eagles, tortoises, and other animals, some of them four feet long. The colors used are white, red, black and green; the sculpture, in some instances, is not bad."[3]

The Indians around Puget sound do not seem to have made such extensive use of carved and painted figures in early times, but painting and especially carving were very common among the Nootka[4] and probably along the Washington coast. The painting of the houses, however, does not seem to have been so common, nor do they seem to have used on their canoes carved images such as were in general use among the Chinook. Whether the images formerly used on the prow of the Tlingit or Haida canoe were of the same character or not is a question.

On Puget sound the house posts were frequently carved and images were occasionally made. The purpose and meaning of these images is doubtful. Among the Chinook they sometimes,

the early writers. For native beliefs there is little besides the collections of myths and texts.

[1] Lewis and Clark, III, pp. 165, 195, 197; IV, pp. 31, 36.

[2] Ibid., III, pp. 166, 169.

[3] Henry-Thompson, p. 804.

[4] Cook, II, p. 326.

at least, represented the guardian spirit or supernatural helper. Mention is made of such an image in one of their tales.[1] Images of this sort, however, represented the supernatural helper of a group rather than the individual guardian spirit, as they were made in human form and all in much the same manner, being partly of carved wood and partly of cedar bark. Gibbs says: "Among the Tsinūk and Tsihalis, the *tamahno-ūs* board of the owner was placed near him [when buried]. The Puget Sound Indians do not make these *tamahnō-us* boards, but they sometimes constructed effigies of their chiefs, resembling the person as nearly as possible, dressed in his usual costume, and wearing the articles of which he was fond."[2] That the carved house posts had some meaning is probable,[3] but just what this was is not evident.

No mention has been found by any early writer of the stone images found so frequently along Columbia river. Henry's mention of flat, painted stones, set up in the house in addition to the wooden images, is interesting, and it is possible that the stone images were for the same purpose. Whether they were made by the Chinook or some earlier inhabitants of the region cannot be determined, but it does not seem necessary to suppose that the Chinook were incapable of making them.

The handles of bowls and spoons, both of wood and horn, were frequently carved to represent various animal forms in whole or in part.[4] Some bowls show a human face, rudely carved in relief on each side. Incised designs on wooden and horn vessels and spoons were also common. These seem to have been chiefly geometrical, to judge from the specimens from the coast of Washington and from the Chinook, and consist largely of concentric circles and rectangles, zigzag lines, and rows of small triangles. One specimen in the American Museum of Natural

[1] Boas, (*h*) p. 201.

[2] Gibbs, (*b*) p. 203.

[3] Compare Boas, (*a*) 1890, p. 564.

[4] Several such spoons, both of wood and of horn, are in the American Museum of Natural History. Figures are given in Swan, (*b*) p. 42; Schoolcraft, III, pl. 35. See also Eells, (*c*) 1886, p. 40.

History shows a human face incised on each end. Swan[1] gives an illustration of a similar specimen. The style of vessel and ornamentation there figured seem peculiar to this region. The latter may be similar to the frieze work mentioned by Cook[2] as so common among the Nootka.

The basketry designs are both geometrical and realistic. Animal designs, more or less conventionalized, appear to be native to the region, as they occur on the oldest baskets and are also said to have been very common on hats, as before mentioned. On the Salish baskets these are more commonly found in a row just below the margin. On Chinook baskets they frequently cover the whole surface, or are intermingled with other designs. Some, such as the flying bird or butterfly, are very much conventionalized and may consist merely of two triangles united at their apexes. It does not seem at all certain in the light of recent investigations that such geometrical forms have been derived from realistic representations.[3] The triangle is one of the most common of all geometrical designs in this region, as in many other places, and is here also interpreted as an arrowpoint.[4] Some of the designs seem strongly suggestive of California influences, such as that on an old Quinault basket figured by Farrand,[5] which would seem to be nothing but the familiar quail-tip design of northern California. Some designs on Chinook twined baskets are almost identical with those on California baskets. It is difficult to distinguish the patterns belonging to the eastern part of this region and those of the western Shahaptian, owing to lack of material and imperfect knowledge regarding the origin of the baskets concerned. This is especially true of the imbricated coiled ware, which is common to both these peoples, all specimens of which are popularly called Klikitat, regardless of origin. The southern coiled baskets in general, however, seem to show a greater resemblance in their patterns to those of northern California than

[1] (*b*) p. 43.
[2] II, p. 326.
[3] Compare Farrand, (*a*) pp. 393-4, 399.
[4] Chinook interpretations were obtained from Mr Edward Sapir.
[5] (*a*) pl. xxiii, fig. 9.

is the case with twined baskets. The arrangement of the design, which is commonly spiral or diagonal, is also similar to that of northeastern California.[1] This is perhaps less true of baskets of known Salish origin than those of Shahaptian make. On Chinook twined baskets and bags the arrangement of the design is very frequently, if not usually, vertical, though a horizontal arrangement in bands is also very common. A vertical or zigzag arrangement is very common on Quinault and Salish baskets, and while here the spiral arrangement also occurs, the patterns are usually smaller and the surface more completely covered than is the case with the Klikitat baskets. All the designs of this region are radically different from most of the modern work of the Nootka, whose designs seem to have been copied from the Tlingit. Of painted designs and figures, as originally executed, we know practically nothing. The Makah paint their hats, bowls, etc., in much the same manner as the Nootka. Garments also were sometimes painted.[2] Decoration of their canoes and wooden bowls with rows of the operculum of a species of Turbinidæ (*Pachypoma gibberosum*) was very common, both on the Columbia and northward.[3] By early writers these were sometimes mistaken for teeth.

Southwestern Oregon

The southwestern part of Oregon belongs to a culture area intermediate between the Columbian and that of northwestern California. Its characteristics, however, are very imperfectly known. This area was occupied chiefly by Athapascan tribes, together with the Takilman and probably the Kusan stocks. Here the head was not flattened. Descent was paternal and the village seems to have been the social unit. The village was usually small and probably consisted of those related by blood, so that marriage with members of other villages would be the rule.[4]

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[1] Compare Kroeber, (*b*) pp. 148, 152.

[2] Boas, (*g*) p. 139.

[3] Lewis and Clark, IV, p. 199; Henry-Thompson, p. 789.

[4] See J. O. Dorsey.

As suggested by Dr A. L. Kroeber,[1] it is unlikely that there was any clan organization. Mr Thomas Smith, the oldest settler in the Umpqua valley, says[2] that he never saw more than three houses together. David Douglas, who visited the Umpqua valley in 1826, found on the upper Umpqua "two lodges and about twenty-five souls, mostly women, the wives of Centrenose, who is chief of the tribe inhabiting the upper part of the Umpqua river."[3] He mentions no larger villages. Mr Smith says their houses were about twelve by fifteen or twenty feet, constructed of light cedar planks, which they were in the habit of moving from place to place up and down the river, as they seldom stayed in one place more than three months. Parrish describes the houses of the coast Athapascans as follows: "Their houses are constructed by excavating a hole in the ground twelve or sixteen feet square and four or five feet deep, inside of which puncheons or split stuff are set upright, six or eight feet high; upon the top of these, boards or thatch are placed for the roof. In the gable end a round hole is made, sufficiently large for the entrance of one person; then descent is made by passing down a pole upon which notches are cut, which serve for steps."[4] Sweat-houses are mentioned but not described. Smith says he never saw a sweat-house in Umpqua valley, but possibly he had in mind the small interior type of sweat-house, with which he was familiar, as it was very common among the Kalapuya.

Salmon was the staple food, especially on the coast. Camas and roots of various kinds, acorns, pine nuts, and berries were also of great importance, particularly for those farther inland. Tobacco was the only cultivated plant.

According to Mr Smith their principal household utensils were baskets, and pestle and mortar for grinding roots and acorns. Shells were used for spoons. Wells[5] says that the Indians of Coos bay used wickerwork cradles. The canoes of

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[1] (*a*) p. 87.
[2] Letter to writer.
[3] Douglas, 1904, p. 354.
[4] Report of the Commissioner of Indian Affairs for 1854, p. 290.
[5] Harper's Magazine, XIII, p. 602.

this region were rude dugouts. According to Vancouver "their shape much resembled that of a butcher's tray, and seemed very unfit for a sea voyage or any distant expedition." [1]

Their dress consisted chiefly of skins. That of the Upper Umpqua tribe is thus described by Douglas: "The garb of the Umptqua tribe of Indians, of whom Centrenose (a native name) is the chief, consists of a shirt and trousers made of the undressed skins of a small deer. The richer individuals decorate this garb with shells, principally marine ones, thus showing their proximity to the sea. The females wear a petticoat made of the tissue of *Thuja occidentalis*, like that which is used by the Chinook Indians, and above it a kind of gown of dressed leather like the shirts of the men, but with wider sleeves." [2] Douglas was the first white man to visit this region. He penetrated south to near the headwaters of the Umpqua, where he met eight Indians, "all of them painted with red earth, and with bows, arrows, bone-tipped spears, and flint knives." They "sat down to smoke, but presently I perceived one of them string his bow, and another sharpen his flint knife with a pair of wooden pincers and suspend it on the wrist of his right hand." These actions Douglas regarded as a sign of hostility, and he soon left them and returned northward. Tattooing [3] was practiced, the women especially being tattooed on the chin and lower part of the face. Wells [4] says that the dead were formerly burned, but at that time (1855) were doubled up and buried in the ground, the grave covered with stones, and the person's property piled around. The excavations of Schumacher show a similar method of burial. Smith says that the only burial he saw was that of a chief who was placed in a sitting posture in the ground.

The above information, while scanty, would seem to show a closer connection of this culture with that of northwestern California than with that of the Columbia. This is seen in the

[1] Vancouver, I, p. 204.
[2] Douglas, 1904, p. 354.
[3] Letter from Mr Thomas Smith; Farrand, (*b*) p. 240.
[4] Harper's Magazine, XIII, p. 602.

lack of deformation of the head, the facial tattooing of the women, the style of dress, the type of canoe, the use of wickerwork cradles and flint knives, and the method of burial, though the last is still more closely related to that practiced in the interior.

Willamette Valley

In Willamette valley we find a single stock, the Kalapooian, whose culture, also known very imperfectly, seems to have occupied an intermediate position between the coast and interior types. There was also considerable variation between the different tribes or bands of this stock; those at the north nearest Columbia river flattened the head and living in wooden houses,[1] while those farther south did not flatten the head, and were of a roving disposition, their only dwelling, when they took the trouble to make one, being of bark or mats.[2] They were in general an indolent and peaceful people, living chiefly on camas and other roots, occasionally hunting deer, of which they were very fond, and also frequently using grasshoppers and other insects as food.[3] The small, low sweat-house of the interior was in common use. Bows and arrows were their principal weapons. Their dress consisted largely of deer-skins, a basket hat being sometimes worn in addition. According to Henry, who visited the valley in 1814, they showed no inclination to trade, caring for little else besides some blue beads, and could not be induced to capture beaver, which were very numerous in their country, for the purpose of selling their skins.

The Kalapuya buried their dead in the earth.[4] One writer describes the process as follows: "When the grave was dug they placed slabs on the bottom and sides, and when they had lowered the wrapped body down, placed another over, resting on the side ones, and filled in the earth."[5]

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[1] Silas B. Smith, p. 255; Gatschet, (*b*) p. 213; Henry-Thompson, p. 812.

[2] Henry-Thompson, p. 814; Letter from Mr Thomas Smith.

[3] Henry-Thompson, pp. 812, 814, 817; Douglas, 1905, p. 78; Wilkes, v, p. 223.

[4] Gatschet, (*a*) pt. I, p. 86.

[5] American Antiquarian, IV (1882), pp. 331.

Southern Oregon

In southern Oregon is found another linguistic stock, the Lutuamian, comprising the Klamath and the Modoc, whose cultural position is somewhat in doubt, but who seem in this respect to occupy a rather intermediate position between the tribes of northern California and those of the interior plateau region. Though considerable material has been collected from this group at different times, not much has thus far been published,[1] and no attempt will here be made to characterize the culture of this particular region.

The Interior

East of the Cascade mountains the region is occupied by tribes having that type of culture commonly designated as plateau or interior. Within the area under discussion were a number of interior Salish tribes, the Shahaptian and Waiilatpuan stocks, and some Shoshonean tribes. The earlier, or what may be called the original (using the word in a relative sense merely), type of the culture of this region has been much complicated by the introduction of the horse, which took place shortly before the region first became known to the whites. This led to a considerable change in the life of the natives, and to a rapid introduction of certain cultural elements, especially those associated with the horse and with the new mode of life which the animal made possible. These probably came with the horse from the region to the southeast, and show a great similarity to the plains type of culture. How much the plains culture had influenced the plateau type before the introduction of the horse is a question. Another difficulty in the way of any general discussion at present is that this region has never been carefully studied. The only detailed study of any tribe in the whole plateau area is that by Teit on the Thompson Indians of British Columbia.

Social Organization. — It would seem, however, that the

[1] Gatschet, (*a*); Coville; G. A. Dorsey, (*a*); Abbott in Pac. R. R. Rep., VI, p. 69.

early culture throughout this area was of a very simple and undeveloped character, which probably accounts for the rapidity with which eastern types were appropriated when once introduced. The social organization[1] was very loose and the chiefs had but little power. The chieftainship was nominally hereditary, but actually depended on the personal qualifications of the individual, the tribe recognizing as leaders only those who had wealth and ability. There were no classes as on the coast. Prisoners of war were commonly held as slaves,[2] but they were usually well treated and frequently adopted into the tribe. Slavery seems to have been an incident of war, rather than a recognized institution as in the Columbian area. Prisoners were sometimes subjected to torture, but were seldom put to death by this means, as was common farther east, even among the Flatheads.[3] The taking of scalps and the scalp-dance was practiced by many of the tribes,[4] probably by all of them. As it seems to have been an established custom among the Klamath and some Californian tribes, it does not seem likely that this custom was of recent introduction. The flattening of the head was practiced to a limited extent by tribes living along Columbia river above the Chinook, but was limited almost entirely to the women and gradually died out toward the east.[5] Aside from regarding it as a mark of beauty, there was no social import attached to the custom.

Food and Manner of Life. — The tribes of this region were more nomadic[6] than those of the coast, and frequently split up into small groups. The extent of their wanderings and the size of the separate bands depended largely on their habitat and the nature of their food supply, which differed with the character of

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[1] Ross, (*a*) pp. 292–3 ; Hale, p. 207 ; Gibbs, (*a*) p. 412.

[2] Ross, (*a*) p. 320 ; (*b*) I, p. 309.

[3] Cox, p. 119.

[4] By the Yakima (Ross, *b*, I, p. 28) ; Nez Percés (Wilkes, IV, p. 465 ; Ross, *b*, I, p. 310) ; Klamath (Gatschet, *a*, p. 16).

[5] Lewis and Clark, III, pp. 125, 137 ; IV, p. 324 ; Hale, p. 213 ; Mrs Whitman, 1891, pp. 91, 95.

[6] For a description of a typical yearly round, with nature of occupation and food for each season, see Hale, pp. 205–6 ; Ross, (*a*) pp. 314–6.

the country. Practically all the tribes of this region, with the exception of some of the Shoshoni, depended to a greater or less extent on salmon, which was the principal food of those living on the Columbia.[1] The preparation of dried and pounded salmon near The Dalles, which has already been mentioned, was common to both the Shahaptian and the Chinookan tribes. Roots were also important, especially camas,[2] and formed the staple food among some tribes. Berries, lichens, and bark were also used,[3] especially by the tribes near the mountains. Game of various kinds, particularly deer, was extensively hunted and formed an important article of food with most of the tribes, besides being of value on account of the skins, which were used for clothing. Some localities were much better supplied with food materials of various kinds than others, and as a consequence the natives of these regions were much better off and much more choice in their selection. Poorer and weaker tribes were kept out of these regions and forced to put up with what they could get in less favored localities.[4] The Shoshoni of the more arid regions lived largely on grasshoppers and other insects, with a few rabbits, grouse, and deer, and do not seem to have been averse to eating almost any kind of animals that came their way.[5] All of the Shoshoni country was not so destitute, however, and certain groups, such as those living in southern Idaho, were well supplied with the necessaries of life. Salmon were caught in the rivers, roots were abundant in the valleys, and the country abounded in game, including the buffalo. The inhabitants of this region presented an appearance very different, according to the early descriptions, from the "Digger" Shoshoni of the desert.[6] Ross[7] divides

[1] Hale, p. 213; Kane, p. 272.

[2] For methods of preparation, which were much the same among all the tribes, see Lewis and Clark, v, pp. 126–7; De Smet, II, p. 488.

[3] Lewis and Clark, v, p. 4; Douglas, 1904, p. 340; Wilkes, IV, pp. 427, 434, 436, 447, 465.

[4] Hale, p. 210.

[5] De Smet, III, pp. 1032–3; Thompson in Report of Commissioner of Indian Affairs for 1854, p. 283; Ross, (*b*) I, p. 270.

[6] Lewis and Clark, III, pp. 1–10, 19–21.

[7] (*b*) I, pp. 249–51.

the Snakes into three divisions, which seem to have been alike in practically everything except material condition and method of living, and, according to his descriptions, in character. It is not unlikely that the general mean and thievish disposition of the less favored bands was due largely to their poverty, and this in turn to their habitat and mode of life. Whether the latter was due to their being prevented from occupying and enjoying the advantages of more favored regions, or to inherited customs and habit, is a question, but it would seem quite probable that the former was the principal cause. This may have had a cumulative effect, however, by continued action on several generations. When visited by Lewis and Clark and by Ross, the more well-to-do Shoshoni were already generously supplied with horses, and this no doubt had much to do with their condition; yet before the introduction of the horse there must have been considerable difference between the tribes living in different surroundings. Possibly to this very difference is due the ready adoption of the horse by some and not by others, though the fitness of their country for the keeping and raising of horses was doubtless also important, and was probably the chief reason for the difference. Later the material prosperity of the Snakes of this region was much reduced, due largely to continued attacks and depredations by the Blackfeet. Some of the tribes along Columbia river seem also to have been very poor and ill-supplied with material comforts,[1] their condition apparently corresponding to the poverty of the region which they occupied, as suggested by Hale.

Some of the tribes were skilful hunters. When hunting with bows and arrows, decoys or disguises of deer and wolf skin were frequently used, so as to enable the hunter to approach more closely without being discovered.[2] Traps and snares of various kinds were common. Game was also surrounded and driven in by a large number of hunters, or was run down with horses,[3] a favorite method where possible and one that doubtless enabled

[1] Cox, p. 229; Hale, p. 210.

[2] Ross, (*a*) p. 297; Lewis and Clark, V, pp. 38, 40.

[3] Ross, (*a*) p. 316; De Smet, III, p. 1026; Lewis and Clark, IV, p. 371.

them to be more successful than before horses were acquired. Fish were caught with seines, dipnets, spears, and hooks, while fish-weirs and traps were not at all uncommon.[1] There is not sufficient material, however, for a comparative study of methods and implements. Food was usually boiled in baskets with hot stones, or, especially in the case of roots, baked over hot stones.[2] Fish, berries, and roots were dried and preserved for future use.

During the early part of the nineteenth century the Indians of the Columbia valley, especially the Shahaptian tribes and the Cayuse, were in the habit of making annual excursions to the plains of the Missouri to hunt buffalo.[3] From fear of the Blackfeet they usually went in large bands, and frequently joined forces with the Flatheads, who were in the habit of hunting in the same region. The Shoshoni tribes of southern Idaho also hunted the buffalo on the Missouri, but when first known to the whites they had been driven out of that region, which they had occupied in earlier times, by the Blackfeet, and visited it only for hunting purposes. When Lewis and Clark first met the Shoshoni they were on their way to the plains for that purpose.[4] The buffalo did not penetrate far into the mountains, but they were common in southern Idaho in the Shoshoni country,[5] though here, also, the raids of the Blackfeet soon made themselves felt. These raids do not seem to have begun until after the Blackfeet got horses. The buffalo occasionally ranged as far west as eastern Oregon in the Snake country,[6] but do not seem to have reached the Columbia valley, though it is possible that a few stragglers found their way into the upper Columbia by way of the northern passes.[7] It is not likely, however, that they formed any considerable part of the food of the natives of that region

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[1] Ross, (*a*) pp. 314–5 ; (*b*) I, p. 269 ; Wilkes, IV, p. 444 ; Lewis and Clark, III, pp. 6–9 ; IV, p. 335 ; V, pp. 22, 47.

[2] Ross, (*a*) p. 317 ; Lewis and Clark, III, p. 124 ; V, p. 130.

[3] Franchère, p. 268 ; Ross, (*b*) I, p. 305 ; Kane. p. 285 ; Wilkes, IV, p. 465 ; Hale, p. 212 ; Gibbs, (*a*) p. 408.

[4] Lewis and Clark, II, p. 378.

[5] Ross, (*b*) I, p. 252.

[6] Allen, pp. 118–125.

[7] Gibbs, (*a*) p. 415 ; Cox, p. 228.

until after the advent of the horse. At the time of Lewis and Clark's visit the Nez Percés seem to have made little use of the buffalo. While the statement is made[1] that in the spring they crossed the mountains to get buffalo robes and meat, they do not speak of buffalo meat among the articles of food used by the Nez Percés, and buffalo robes were certainly not so common as later. Only one buffalo-skin lodge is mentioned. Though the manner of life, food, etc., of the Indians farther down the river, such as the Wallawalla, are described, no mention is made of their ever crossing the mountains; nor do they seem to have had any great number of horses, such as is ascribed to them by later travelers. On the Columbia near the mouth of the Yakima there were numerous Indians who were visited by Clark in 1805, but he says that while he saw a few horses the natives appeared to make but little use of them. If these were the Yakima Indians, there must have been quite a change in their manner of life in the next few years.[2] All this would tend to show that the horse, while common in the Columbia valley at that time, was not yet very numerous nor had at that time very seriously modified the earlier customs of the natives. Considering that the advance of the horse northward would probably be as rapid as its natural multiplication would allow (these tribes being usually at peace with one another), this corresponds very well with the time of the introduction of the horse among the Lower Thompson Indians (toward the close of the eighteenth century), as given by Teit.[3] They did not become common among the Thompson Indians, however, till 40 or 50 years later. The introduction of the horse enabled the Columbia valley Indians to become more successful hunters, and particularly to extend their hunting trips to more distant regions and return with great quantities of dried meat, skins, etc., which without pack animals would have been impossible. It would hence seem very doubtful if the Shahaptian tribes hunted the buffalo before they acquired horses.

[1] Lewis and Clark, III, p. 106.

[2] Compare Ross, (*b*) I, p. 19.

[3] (*a*) p. 257.

Shelter. — Corresponding to their general nomadic habits, the mat lodge formed the principal dwelling of the tribes of this region, and many seemed to have had no other kind. These mat lodges[1] were occasionally circular, but usually rectangular, sometimes more than 150 feet long, and 12 to 15 feet wide. There were no partitions, and a whole village of 40 or 50 families might dwell in a single lodge.[2] The sides usually sloped in like the roof of a house, almost meeting at the top, but leaving an opening along the ridge for the exit of smoke. According to Ross[3] the winter houses of the Okinagan were built in the same way, but sunk slightly in the ground and covered with grass and earth. Sometimes the sides of the lodge were perpendicular and the roof flat.[4] The Shahaptians along Snake river frequently used a framework of split timber, somewhat like rails, to form the sides and the top;[5] these also served as a sort of scaffolding for drying fish. There seems to be no good reason for associating this with the type of wooden house used on the coast. While the underground winter house,[6] with entrance through the roof, was probably known throughout the region, references to its occurrence are very few. Such a house was seen by Lewis and Clark[7] on the north side of the Columbia near the mouth of White Salmon river, but uninhabited at that time (1805). The Chinook, so far as we know, never erected such houses. Possibly this was of Shahaptian make, but for reasons to be discussed more fully later, it would seem more likely to have been Salish. So far as described it does not differ from the winter house of the Thompson Indians. The pit of an underground house, according to Clark,[8] was found among the Nez Percés. Gibbs[9] mentions what were probably similar pits on

[1] Lewis and Clark, III, pp. 104, 122, 126; IV, pp. 358–9, 361; V, p. 18; Cox, p. 84; Ross, (*a*) p. 313; Gass, p. 212; Gibbs, (*a*) p. 407; Gairdner, p. 253; Lee and Frost, p. 190.

[2] Lewis and Clark, V, p. 18.

[3] (*a*) pp. 313–4.

[4] Lewis and Clark, III, p. 126.

[5] Ibid., III, pp. 108, 112, 115; V, p. 100; Gass, p. 212; Wilkes, IV, p. 462.

[6] For a description of this type see Teit, (*a*) pp. 192–5.

[7] Lewis and Clark, IV, p. 280.

[8] Ibid., V, p. 35.

[9] (*a*) p. 409.

the lower Yakima, and Smith [1] also found house-pits in Yakima valley. Kane [2] describes a somewhat similar house used by the Wallawalla, but much ruder. We also know that such houses were used by the Klamath.[3] It is possible that the introduction of the buffalo-skin lodge had something to do with the apparent scarcity of the underground dwelling in historic times. Lewis and Clark [4] in 1806 mention but one buffalo-skin lodge among the Nez Percés, and that was apparently reserved for special occasions. A few years later the buffalo-skin lodge had practically supplanted the mat lodge among the Nez Percés, and was in more or less common use among all the interior Salish and Shahaptian tribes, especially those who were in the habit of crossing the mountains to hunt buffalo. It is also possible that the Shahaptian tribes were not in the habit of using such houses, and that the house-pit mentioned by Lewis and Clark indicates something of a different character. The mountain Snakes, according to Ross,[5] never used underground houses.

Household Utensils. — The household utensils were few, baskets and bags being the most important. Pottery was not made except among the Shoshoni.[6] Spoons of wood or horn were in general use, and also wooden dishes and bowls. Parflèches were later common among many of the tribes, but were probably introduced. Mats, of course, were of great importance. Elk-horn wedges or chisels were used for splitting wood, as were also stone hammers, sometimes carved.[7] It is not certain what sort of implements were used for grinding and pounding roots, dried fish, etc., but from the presence of the numerous stone mortars that have been found along the Columbia, it is possible that these were used for that purpose. While stopping at one of the Nez Percés villages, Lewis wrote:

[1] (*d*) p. 552.
[2] P. 272.
[3] Gatschet, (*a*) pt. I, pp. 117, 124; Abbott in Pacific R. R. Rep., VI, p. 69.
[4] V, p. 16.
[5] (*b*) II, p. 117.
[6] Lewis and Clark, III, p. 19; Ross, (*b*) I, p. 273.
[7] Lewis and Clark, III, p. 124.

"The noise of their women pounding roots reminds me of a nail factory." [1]

The imbricated coiled ware made by the western Shahaptian and Salish tribes has already been referred to. All these tribes also made various kinds of twined ware. "The soft hat in wrapped twined work and most of all the twined wallet overlaid predominate with the Shahaptian, but the Salish have a wide range of technique." [2] False embroidery is also very common on Shahaptian bags. The Shoshoni make twined ware of various kinds, but also use coiled work, especially in their water-bottles.

Canoes. — The canoes of this region were mostly rude dug-outs. Some of the more northerly Salish tribes used bark canoes,[3] and some of the eastern Salish, as the Flatheads, had no canoes at all.[4] The Shoshoni, even where living largely by fishing, were also without canoes, using rafts of reeds for crossing rivers and for similar purposes.[5]

Clothing and Ornaments. — The clothing worn by the natives of the larger part of this area in historic times is of the same general character as that of more easterly tribes, consisting of shirts, leggings, and moccasins for the men, and a somewhat longer shirt or dress with leggings and moccasins for the women. These were usually of dressed buckskin, and extensively ornamented with fringes, beads, and porcupine quills. Various sorts of ornaments were worn, such as bear-claws, elk-teeth, feathers, etc., eagle feathers being particularly valued.[6] Marine shells, obtained by trade, were found over all the region. The men frequently wore, especially when hunting, caps of skin, while the women sometimes wore a sort of basket-hat or rimless cap, which among the Shahaptian tribe is usually of wrapped twined weave. Robes of skins, in later times frequently of buffalo

[1] Lewis and Clark, v, p. 16.
[2] Mason, p. 488.
[3] Pacific R. R. Rep., I, p. 296.
[4] Gibbs, (*a*) p. 415.
[5] Ross, (*b*) I, p. 274.
[6] Lewis and Clark, v, p. 119.

skins, were commonly worn in addition to the above.[1] The dress above described is that of the more prosperous hunting and horse-raising tribes. The advantage of the horse in hunting has already been referred to, and it seems very evident that this dress was in part, at least, of recent introduction. Lewis and Clark repeatedly speak of the similarity of much of the clothing worn by Indians along the Columbia to that of the Shoshoni. These Shoshoni were those living on Lemhi and Salmon rivers of Idaho. They were accustomed[2] to hunt buffalo on the plains of the Missouri, and complained that their enemies, the Minitari and the Pakees, or Blackfeet, drove them into the mountains, but that if they only had guns, as their enemies had, they could then live in the buffalo country on meat just as they did. The clothing and equipment of these Shoshoni were much the same as the plain's type, and it is quite probable that they had formerly lived farther east. Of the different articles of clothing worn by the Nez Percés, Lewis says: "These are formed of various skins and are in all respects like those particularly described of the Shoshones."[3] Along the Columbia the similarity was not so complete;[4] but even as far down as the Upper Chinook many articles described as similar to those of the Shoshoni were found.[5] All of these, however, they declare were obtained by trade from other tribes and from those "who sometimes visit the Missouri."[6] There are certain indications that this extensive introduction of eastern clothing took place about the time of Lewis and Clark's visit. When passing down the Columbia in 1805 they found the women wearing quite a different dress, consisting merely of a breech-clout of buckskin with occasionally the addition of a small robe of skins.[7] This is

[1] For clothing see Lewis and Clark, III, pp. 1–6, 10 (Shoshoni), 105; V, pp. 29–31 (Nez Percés); Ross, (*a*) pp. 296–7 (Okinagan), 127 (Wallawalla); Ross, (*b*) I, p. 306 (Cayuse, Nez Percés).

[2] II, Lewis and Clark, p. 383.

[3] Ibid., V, p. 30.

[4] Ibid., III, p. 125; IV, p. 317.

[5] Ibid., IV, pp. 239, 284, 289.

[6] Ibid., IV, p. 303.

[7] Ibid., III, pp. 125, 137, 143.

exactly the same dress as that worn by the Chinook women above the mouth of the Willamette.[1] When these explorers returned up the Columbia the following year, they found the Indians, particularly the women, much better dressed, and in the eastern or Shoshonean style.[2] A few years later Cox[3] mentioned the older type of dress as found only among a few miserable fishing tribes along the Columbia above the mouth of the Yakima. As before suggested, it is quite likely that the mode of life of these tribes had much to do with their style of dress, and that the tribes depending largely on the hunt would be better supplied with skins for clothing than those subsisting chiefly on fish. It is also evident that in most of this region the scanty vegetation makes clothing from plant material difficult, if not practically out of the question. Moccasins and leggings were probably more or less common over all the area. Robes of twined strips of rabbit and other skins were common. The more northerly tribes also made blankets or robes of the wool of the mountain goat.[4] That the dress of this region even in earlier times, however, resembled to a certain extent that of the plains, is made probable by the finding of a costumed human figure in the upper Yakima valley. The style of dress shown by this figure strongly suggests the plains type.[5]

Weapons and Armor. — For weapons[6] they had bows and arrows, spears or lances, knives, and clubs. The bows were of wood or horn, backed with sinew. The horn bows were made of one or of several pieces of horn glued together, and were probably more common among the Shoshoni.[7] Flint or obsidian was used extensively for arrowpoints and knives.[8] The war-club consisted of a stone encased in rawhide and fastened to a short handle. This is the same as that used by the eastern Indians and was

[1] See p. 167.
[2] Lewis and Clark, IV, pp. 322, 337.
[3] P. 229.
[4] Franchère, p. 284 ; Mason, pp. 412, 437.
[5] H. I. Smith, (*c*) ; (*d*) pp. 552–3.
[6] Lewis and Clark, II, p. 373 ; III, pp. 19–21 ; Ross, (*a*) p. 318.
[7] Lewis and Clark, III, p. 20 ; Schoolcraft, I, p. 212 ; Henry-Thompson, p. 713.
[8] Lewis and Clark, III, pp. 19, 127.

probably introduced. The hatchet or tomahawk does not seem to have been used in early times. As elk- or antelope-skin armor was used by the Shoshoni,[1] by the northern Salish,[2] and by the coast and California tribes, it was probably used to some extent throughout this area. Round skin shields, painted and ornamented with feathers, were also used. These may have been of eastern origin.

Burial. — The method of disposing of the dead seems to have varied considerably among the tribes and even within the same tribe. Along the Columbia below the mouth of the Snake "vaults" or burial houses much like those found among the Upper Chinook were used.[3] A somewhat similar method was observed even among the Nez Percés.[4] The latter sometimes also used scaffolds, apparently after the fashion of the plains Indians; but the more common method of disposing of the dead was by burial in the ground, especially on stony hillsides, and covering the graves with stones to keep off the wild animals.[5] This seems to have been the prevailing method throughout the whole region.[6] Frequently, at least among the Salish tribes, the body was doubled up and buried in a sitting position, but whether this was always the case cannot be determined from the brief descriptions. Gibbs[7] reports having seen near the mouth of the Okanagan river bodies wrapped in blankets and bound upright to the trunks of trees at some distance above the ground. This suggests the tree burials practiced by the coast Salish, but does not seem to have been the ancient method.

Art. — The art of this region consists chiefly of decorative designs, including the ornamentation of bags, baskets, and hats; porcupine-quill and bead work on clothing, cradles, etc., and painting on moccasins, shields, parflèches, and possibly robes. Plastic art seems to have been rare. The western Shahaptians

[1] Lewis and Clark, III, p. 21.
[2] Teit, (*a*) p. 265.
[3] Lewis and Clark, III, pp. 139–40.
[4] Ibid, IV., p. 369.
[5] Ibid., IV, pp. 366–7, 371; V, p. 99.
[6] Ross, (*a*) pp. 320–1; Cox, p. 105; Douglas, 1904, p. 339; Gibbs, (*a*) p. 405.
[7] (*a*) p. 413.

possibly did some carving of the handles of bowls and spoons similar to that of the Columbian area. Clark[1] mentions a "malet of stone curioesly carved" which he saw used by the Indians near the mouth of Snake river. No mention has been found of other stone carvings, but this suggests that the stone objects, images, etc., previously mentioned as being frequently found along the Columbia, both above and below The Dalles, were at least not unknown to the Indians of that time. Eells[2] mentions two stone carvings which he describes as horses' heads. If this interpretation be correct, the modern character of the work is evident. It is unfortunate that no figures of these specimens have been given. That the so-called baboon or ape heads, however, are correctly named seems extremely doubtful. Considering the general crudeness of the native art, together with the tendency to represent imaginary and mythical beings, any theories based on such supposed resemblances are extremely hazardous, unless rendered probable by other facts and conditions.

The Klikitat basket designs have already been mentioned, together with the fact that they resemble both in character and arrangement the designs in northeastern California. The pattern arrangement of the hats also is usually zigzag or diagonal. The twined bags made by the western Shahaptians of the same region show considerable variety in design, some being quite complicated. A large number of these are arranged horizontally, sometimes in bands. Many of them show the influence of the plains culture, some designs resembling those commonly painted on parflèches, while other are more like the beaded work on pouches. Owing to lack of material it is impossible to make any comparison with other tribes of this area.

According to the early writers, porcupine quills were much used for decorating articles of clothing. Later beads were used for this purpose. The designs were doubtless originally geometrical, but the modern designs are largely floral. Floral and plant designs in bead work are particularly common among the

[1] Lewis and Clark, III, p. 124.

[2] (*d*).

Nez Percés, though some geometrical designs still occur. Part of these geometrical designs may be original, but others, such as the parallel lines on bags and pouches, strongly suggest eastern influence. The floral designs are well illustrated by their cradles and pouches, which are often completely incrusted with beads. Floral designs are also found among the Salish tribes, but to a much less extent. The Nez Percés are said to have woven, in former times, geometrical designs in woolen blankets.[1] Of painting, aside from the designs of parflèches and rawhide bags, which are evidently modern and of recent origin, we know but little. In early times shirts and moccasins are mentioned as having been painted. Some buffalo-skin parflèches from Columbia river are ornamented with designs formed by scraping away the external pigmented layer of the skin, thus exposing the lighter layer underneath and giving the effect of light and shade. This method in early times was practiced by the Sioux, according to their traditions.[2]

A peculiar method of decorating their buckskin shirts is sometimes resorted to, especially among the Nez Percés. This consists in cutting out small square or irregular pieces, so as to leave the garment punctured all over with holes.[3] Among neighboring tribes this method of decoration is commonly limited to a few inches of the margin, though a similar custom exists among the Lower Kutenai,[4] Cree,[5] and some Athapascan tribes.

TRADE AND TRIBAL MOVEMENTS

The lines of trade or what might be called trade-routes throughout the region correspond in general to physical or geographical conditions, and follow the lines of easiest intercommunication, with a few minor though interesting exceptions. There was a considerable amount of coasting trade, especially from the mouth of the Columbia northward, carried on chiefly

[1] Mason, p. 437.
[2] Wissler, p. 259.
[3] Ross, (*b*) I, p. 306.
[4] Chamberlain in Rep. Brit. A. A. S., 1892, p. 569.
[5] Boas, information.

by the Chinook and the Makah.[1] South of the Tillamook, along the Oregon coast, there are no records of such traffic, and we have already noted that south of the Columbian area the canoes were not fitted for ocean voyages. While the timber may not have been so favorable for canoe making, the reason must have been psychological rather than physical, as is also indicated by the fact of their somewhat different culture. From the coast inward there was only one trade-route of importance. This led up the Columbia river to The Dalles, where was found the greatest trading center in the whole region, and whither the tribes were wont to come from north and south as well as from the east.[2] Klamath,[3] Cayuse, Nez Percés, Wallawalla, and other Shahaptian and probably Salish tribes were all in the habit of going thither to traffic and exchange their products or possessions for those of other regions. Farther east the Shahaptians in their turn traded with the Shoshoni, from whom they obtained buffalo robes and meat. A favorite center for this trade, at least in later times, was at the Grande Ronde in eastern Oregon.[4] Probably this latter center, and a large part of the trade connected with it, arose only after the horse came to occupy an important place in the lives of the natives and to make traveling on the plains easy. In earlier times trade doubtless followed the river more closely. Certain similarities already pointed out between the upper and lower Columbia would suggest this. Trade was not, however, confined to water routes. The Okinagan, for example, crossed the mountains to Puget sound, trading wild hemp for sea-shells, especially dentalia, as well as for other small objects.[5] Such trade, however, involving traveling over long and difficult mountain trails, was of necessity limited to small and valuable articles. The Yakima also in later times crossed the mountains and traded with the Puget sound tribes.[6] If trade was carried on by this route in earlier

[1] Swan, (*b*) p. 30.
[2] Lewis and Clark, IV, p. 289 ; Ross, (*a*) p. 117.
[3] Gatschet, (*a*) pt. I, p. 93.
[4] Wilkes, IV, p. 394.
[5] Ross, (*a*) p. 290; (*b*) I, p. 44.
[6] Gibbs, (*a*) p. 408.

times its effect seems to have been slight, as archeological investigations in the Yakima valley show little influence of coast culture on that region. It is possible that this also became customary only after the horse was introduced. There was also a considerable amount of trade northward with the Thompson Indians[1] and other tribes of British Columbia. This was carried on chiefly through the Okinagan, but even the Wallawalla, at least in later times, visited that region. West of the Cascades there was a certain amount of trade from Puget sound south to the Columbia. On reaching The Dalles, Lewis and Clark found numerous articles of European manufacture, which came from "white people who come into the inlets to the north."[2] There seems to have been very little trade from the Columbia southward, in spite of the fact that the Willamette valley offered an easy line of communication. Here again psychological factors seem to have prevented what physical features apparently favored. While Lewis and Clark found numerous European articles among the Nez Percés in 1805, only a few years after trade was first opened with the Pacific coast tribes, eight or ten years later the Kalapuya were not only practically destitute of such articles but were disinclined to trade of any kind.[3]

The difficulty of arriving at a true understanding of early conditions east of the Cascades, because of the presence of the horse in that region in historic times, has been indicated several times already. That the horse had a tremendous influence on the extent of the trading journeys undertaken is undoubted. The Wallawalla and the Cayuse seem to have been accustomed, about 1840 or earlier, to make long trips to the south, sometimes going as far as central California.[4] The possession of the horse also made these tribes more formidable in war and able to carry out more extensive war expeditions, and tended to make them still more nomadic than in earlier times. There has

[1] Teit, (*a*) p. 258.
[2] Lewis and Clark, IV, p. 289.
[3] Henry-Thompson, p. 817.
[4] Swan, (*a*) pp. 313–4; Kane, pp. 281–2; Palmer, p. 124; Wilkes, IV, p. 397.

doubtless been a considerable shifting of the tribes within the period since the presence of the horse first began to make itself felt, say about 125 or 150 years ago. We know that some of the Shoshonean tribes, who formerly lived east of the Rockies, were pressed south and west by the Blackfeet. It is not at all improbable that these in turn pressed upon the Shahaptian tribes of the Columbia valley. The two were deadly enemies at the time of Lewis and Clark's visit. The Nez Percés were at war with the Shoshoni along Snake river, and the southern bank of the Columbia was found to be uninhabited from near the mouth of the Wallawalla to below The Dalles,[1] because of fear of attacks by the Snakes. Later the Shahaptian tribes acquired horses, became more prosperous, and drove back the Snakes from the neighborhood of the Columbia. It would appear that in the meantime certain Shahaptian tribes also had moved northward and westward and forced back the Salish tribes which at the time of Lewis and Clark's visit were along the north bank of the Columbia and on its tributaries.[2] These tribes were particularly the Klikitat and the Yakima, an assumption supported by the definite assertion of the natives themselves, a number of old men positively assuring Dr Suckley that they had pushed their way into the country formerly occupied by members of the Salish.[3] The Yakima probably lived on the Columbia near the mouth of the river that bears their name, and are in fact so located by Cox, who places them on the north and east side of the Columbia. As late as 1854 the Palus, a tribe living farther east, on Paloose river, regarded themselves as a portion of the Yakima and the head chief of the Yakima as their chief.[4] The general similarity of the Wallawalla language to that of the Klikitat and the Yakima, rather than that of the Nez Percés, would also be in accordance with this view. Archeological researches in upper Yakima valley, according to Mr H. I. Smith,[5] shows as great a similarity of the art products

[1] Lewis and Clark, III, pp. 149, 163.

[2] Ibid., VI, pp. 115, 119; compare Mooney, pp. 734, 736.

[3] Gibbs, (*b*) p. 224.

[4] Stevens in Pac. R. R. Rep., XII, pt. I, p. 200.

[5] (*d*) pp. 553–4.

of that region to those of the Thompson river region as to those of the Columbia valley below the mouth of the Snake, though it must be added that no very careful researches have thus far been made on the Columbia. This is certainly not contrary to the view of an earlier occupancy of this region by the Salish.

The Klikitat were, according to Gibbs,[1] in all essentials like the Yakima, and were driven from their earlier home by the Cayuse. This must have been farther east and south of where we know them to have lived in historical times, viz: on the southern slopes of Mount Adams and Mount St Helens. Although this region was well wooded, they still lived in mat lodges. Later they pressed still farther west into the Cowlitz valley, sometimes nearly reaching the coast in their wanderings.[2] Thence they turned southward, crossed the Columbia about 1839, and in 1854 we find them not only in Willamette valley but even as far south as the upper Umpqua.[3] They also became quite nomadic in their habit, and considerably given to trade and trading expeditions, till finally they were forced to confine themselves to their earlier home in Washington.

The above discussion would seem to indicate that in earlier times the Salish tribes occupied most of the territory north of the Columbia, while the Shahaptian tribes were probably situated mostly south or east of that river. The fact that there is probably a certain similarity between the Shahaptian and Lutuamian languages also serves to point to an earlier period of contact, which a residence of the Shahaptian tribes in northern Oregon would make possible.

The Columbia valley is another illustration of the fact that trade as a rule follows the line of least physical resistance. War or hostility of peoples does not prevent trade and may, in part, be the cause of it by making the products and possessions of the one people known to the other. The Shahaptians and the Chinook have not always been at peace with each other, the latter being at one time, at least, forced to retreat from The

[1] (*a*) p. 403.
[2] Swan, (*a*) p. 323.
[3] Gibbs, (*b*) p. 170; Stevens, p. 224.

Dalles,[1] but trade was soon flourishing as before. Similarly the Shoshoneans and Shahaptians were almost continually at war, according to the early writers, yet the Shoshoni culture is just the one the Shahaptians adopted.

The movements and migrations of tribes, on the other hand, do not always follow the line of least physical, *i. e.*, geographical, resistance. As a rule, such lines are well adapted to human habitation, and hence more or less thickly populated, of which the Columbia is a good example. Such a population, of course, resists encroachments by other peoples, and unless such movements are in sufficient force, and of sufficiently savage character, to drive out or destroy the original population, some other route would be easier. One people might absorb another, either peaceably or by conquering them and taking them into the tribe, but such a change would of necessity be slow, and to bring about in this way a change in the language of a particular region, for example, would require considerable time and continued contact of the two peoples.

In the region under consideration the Klikitat are the only tribe who have changed their location to any considerable extent within historic times. These movements, already described, did not follow trade-routes, but first led west across the mountains north of the Columbia, and then across the river to the south. Lack of a dense population and conditions favoring their manner of life, which at that time was hunting, doubtless caused the choice of this route. It is known from linguistic evidence that there has been considerable shifting of tribes in earlier times, and that one group of tribes, the Athapascan, has doubtless come from much farther north. Whether this movement was peaceable or hostile is not known, but the home of certain tribes, as the Kwalhioqua and Tlatskanai, was not in the most favorable localities, as they occupied a rough and wooded country. Hale[2] speaks of meeting an Umpqua Indian on the Columbia, which he had reached through the Tlatskanai country, and says that "it appeared that a connection of some kind

[1] Henry-Thompson, pp. 853, 879.

[2] P. 204.

existed between the two tribes." This was doubtless along the mountains, and probably the territory into which these two Athapascan tribes moved was practically unoccupied by others. Thus getting a foothold, they might later have spread and occupied more favored areas, driving out or absorbing the earlier inhabitants. It is possible that this is what took place in southern Oregon. Such movements of tribes or bands, following the line of least resistance, would avoid the most populous regions.

Another problem connected with this region is that regarding the earlier home and distribution of the Salish tribes. The Tillamook, who lived on the Oregon coast south of the Columbia, were separated from the other tribes by the Chinook. They may have crossed Chinookan territory to their present position, or the Salish tribes may formerly have been continuous along the coast, and the Chinook, pressing down the Columbia, have separated the Tillamook from their more northerly neighbors. As there are certain reasons for regarding all the coast Salish as coming originally from the interior, the former supposition may be regarded as the more probable.

Both the Chimakuan and Waiilatpuan stocks consist of two groups separated by intervening tribes. In the case of the Chimakuans it is not impossible that the Salish tribes have been the aggressors, and that the Chimakuans formerly occupied a much larger and continuous area. Of the Waiilatpuans we know but little, and their linguistic position is not at all clear. The Cayuse, as far back as anything is known of them, have been closely associated with the Wallawalla. Their relationship to the Molala, who lived in the Cascade mountains, is still to be investigated. If one band separated from the others, the movement must have been "across country," so to speak.

From the considerable intermixture of small tribes, of different linguistic stocks, as well as what little we know from historical evidence, it would seem that most of these changes have been brought about by the movements of relatively small bands, who pressed into other more or less unoccupied regions, and hence not the most favorable; but there acquiring a foothold they

gradually spread and extended their territory at the expense of their neighbors.[1]

The general similarity of physical types along the coast, and their decided difference from the interior types, would indicate that where interior tribes have pressed to the coast the earlier inhabitants have been absorbed rather than destroyed. This would also be supported by the common practice of intermarriage.

ARCHEOLOGY

The archeology of this region is but imperfectly known. The stone arrowheads, stone mortars and pestles, and carved stone images and animal heads found along the Columbia from the mouth of the Willamette to near the mouth of the Snake have already been referred to, and show that the similarities throughout this region are not of recent origin. Some of the finest and best finished carvings come from above The Dalles, while very few, if any, have been found below the mouth of the Willamette. It would hence appear that this stone work, if it did not originate, at least had its highest development in a region where wood was scarce, and thence probably moved down the river. On the lower river wood-carving probably took its place, as the wood here was soft and easily worked with stone and shell tools. The resemblance of the archeological material of Yakima valley to that of Thompson river and its difference from that of the coast region have already been mentioned. Investigations by Mr Harlan I. Smith in the coastal region show that "the southern limit of north Pacific coast culture and the northern limit of important influence from the Columbia seem to coalesce in the region from Shoalwater bay to Seattle."[2] This corresponds in general with the results of our ethnological study.

MYTHOLOGY

Our knowledge of the mythology of this region is unfortunately very incomplete. Aside from a few scattering tales, the

[1] Compare J. O. Dorsey, p. 237.

[2] H. I. Smith, (*a*) p. 565.

only collections are those of Boas and Farrand, which are limited to the Columbian area. The well-organized myth cycles, such as that of the Raven, found among the coast tribes farther north, do not occur in this region, though many of the elements contained in these cycles are found. As shown by Boas,[1] the number of these common elements gradually decreases as we go south, and they frequently occur in different associations. The prominent characters also are different. The transformer is found among all the tribes. By the Puyallup he is called Qonē ;[2] by the Chihalis, Qonéqonē ;[2] by the Quinault, Misp' ;[3] by the Chinook, Shikla ;[4] by the Tillamook, As'aíyahatl ;[5] and by the Alsea, Shiō'k.[6] Among the interior tribes Coyote appears as transformer. Coyote and Shiō'k also appear as tricksters, but in the coastal region north of the Alsea the transformer and trickster stories are ascribed to separate individuals. The Raven occupies a prominent place in the mythology of the coast tribes south to the Quinault, where his place is taken by the Bluejay. Here the Bluejay (who appears as trickster) and the transformer are separate individuals. The same separation is found among the Chinook. Among the Upper Chinook[7] Bluejay occupies a minor position and Coyote becomes common as a trickster besides acting to a certain extent as transformer. The Salmon is one of the important characters of the Chinook, and is said to be a "great chief." The salmon myth of the Upper and Lower Chinook is practically identical. From what little is known of Upper Chinook myths, these seem to include both plateau and coast types and incidents. Coyote, for example, seems to be most prominent among the Upper Chinook both as transformer and trickster, but other animals also occur quite frequently in these characters. Eagle is sometimes transformer.

[1] (*f*) pp. 329–63.
[2] Boas, (*i*) p. 155.
[3] Farrand and Kahnweiler, p. 81.
[4] Boas, (*d*) p. 17.
[5] Boas, (*g*) p. 140.
[6] Farrand, (*b*) p. 246.
[7] Information regarding the Upper Chinook was obtained from Mr Edward Sapir.

Weasel seems to correspond to Mink among the Kathlamet[1] and Salish to the north. There is a story of Raccoon very similar to that of the Kathlamet.[2]

No one character occupies a very prominent place among the Lower Chinook, but both transformer and trickster stories are told of several different individuals. Coyote has certain functions of the transformer, such as the introduction of local taboos,[3] but is not at all prominent. This ascription of both transformer and trickster tales to more than one individual, as well as the nature of the elements making the myths, indicates that they have been derived from various sources.

The Chinookan mythologies seem to lack the unity found among the Alsea farther south,[4] where the stories are grouped around the transformer Shiō'k, who also exhibits the characteristics of a trickster. Boas[5] has shown that many elements of the Chinook myths are found also among the Algonquians and Sioux, and that these have apparently reached the coast by way of Columbia river. This is illustrated by the incident in the deluge story accounting for the way in which earth was first obtained from the bottom of the waters. According to the Algonquians around Lake Superior the muskrat first succeeded in bringing up some mud, out of which the land was made. Among the Kathlamet and Molala near the mouth of the Columbia it is also the muskrat who succeeds in bringing up earth from the bottom of the water. While this story has reached the Pacific coast in two other places, it is only on the Columbia that the muskrat appears as the successful diver.

This story does not seem to have spread along the coast, but other elements common to the Chinookan and eastern myths appear to have done so. Their number, however, diminishes with increasing distance from the Columbia. The importance of the Columbia as a trade route has already been shown, and

[1] Compare Boas, (*h*) pp. 103–17.

[2] Ibid., pp. 142–54.

[3] Boas, (*d*) pp. 101–6.

[4] Farrand, (*b*) p. 245. This difference, if such really exists, is of course only relative. Our knowledge of the mythology of both groups is very incomplete.

[5] (*f*) pp. 329–63.

the conclusion seems obvious. The same transmission and borrowing of myth elements also occurs along other trade routes to the Pacific, such as that which led from Athapascan territories to the country of the Bellacoola, and that down the Fraser river.

Unfortunately we do not know sufficient of the Shahaptian and Shoshonean mythology to know just how far it corroborates this conclusion. As these were on the line of trade between the Chinook and the Sioux, a study of their mythology would prove of great interest. Their myths seem to center largely around the Coyote, who is preëminently a trickster, as throughout all the plateau region. Coyote also performs certain functions of the transformer. Whether there are other transformers, as among the Thompson Indians, is not clear.

CONCLUSION

Bearing in mind the general truth that no culture is independent and that all cultures tend to shade into each other to a greater or lesser extent, the facts here briefly brought together show two definite culture areas, the Columbian and the Plateau, with a comparatively definite boundary between them; and a southwest Oregon type, intermediate in character, yet probably more closely related to that of northwestern California. The Columbian and Nootkan cultures have been shown to be very similar, especially in early times before the peculiar social organization of the more northerly tribes, with its attendant phenomena, had spread so far southward. Indeed the Columbian and Nootkan may more properly be regarded as subdivisions of one general culture area, overlapping and intermingling along the central coast of Washington. The culture of the Puget sound tribes is also somewhat different from that on the Columbia, and is affected by both the northern and interior types. The influence of the California culture also made itself felt in the Columbia area, as shown in the feather ornaments and basket designs. The culture of the major portion of the Kalapuya seems so near that of the Plateau region that they may be

regarded as belonging to that area, but as having adopted many elements of the Columbian culture, such as the flattening of the head, living in wooden houses, etc., where they touch the Columbian tribes. The slight extent to which Columbian culture has penetrated the Kalapuyan region is rather remarkable, considering the lack of physical barriers to intercommunication, and shows a much more marked conservatism on their part than was the case with the Shahaptian tribes. While it must not be forgotten that the Kalapuyans did not live on what may be regarded as a through trade route, that physical conditions to the south were not such as to particularly favor trade or travel, and that the region tributary was relatively small, the whole difference cannot be ascribed to the physical conditions, though the continued action of these conditions through generations may have led to such a general attitude.

On the Columbia river, following the line of trade, there is considerable overlapping of coast and interior cultures. This is seen both in material culture and in mythology, and even the physical type of the tribes on the lower Columbia seems to vary toward the interior type, pointing to an apparent admixture from this direction. The cultural resemblance is shown in the custom of flattening the head, in the basketry, clothing, ornaments, method of wearing the hair, and the method of burial. The woman's dress of the Upper Chinook is distinctly interior. The burial house, while different from the method used on the coast, has most probably originated in a wooded region, doubtless below The Dalles, and has thence probably spread up the Columbia. There may have been other resemblances between these two regions, but unfortunately the eastern culture was already making itself strongly felt above The Dalles when this region first became known, and the earlier type rapidly disappeared. The archeological finds also show a marked similarity throughout the same area, extending from about the mouth of the Willamette to that of the Snake, and indicate that these resemblances are not of recent origin.

Considering the extremely simple social organization common

in all the Plateau region, the differences in material welfare found in various parts seem to have been due largely to physical conditions. It has not seemed possible to work out the minor variations, which were independent of the physical surroundings and due to the play of historic events before the advent of the horse, but it is probable that there was a certain amount of eastern influence on the region before that time. The introduction of the horse led to a decided change in the life of many of the tribes east of the Cascades. From a condition in which, while more or less nomadic, they still depended largely on fish, they came to depend much more on hunting and extended their hunting expeditions into more distant regions. This led to, or at least accelerated, the adoption of many features of the eastern or plains culture, especially those associated with the horse and the buffalo. The original simplicity of their culture doubtless made them all the more ready to accept these changes, which were so decidedly to their advantage. As by these means certain tribes became more prosperous and powerful, other tribes were pressed back, and a shifting of tribal boundaries took place.

Many points regarding the prehistoric tribal movements could probably be decided by archeological investigations, and the need of these is evident. Still more pressing is the necessity for the collecting of the ethnological and linguistic material. The material culture of most tribes has already largely disappeared. In some cases the tribes are almost extinct, and in nearly all it is only the older individuals who know the former practices and beliefs. Even the languages are weakening and passing out of use, so that whatever is done to preserve this material from utter loss cannot be much longer delayed.

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HISTORICAL JOTTINGS ON AMBER IN ASIA

BY

BERTHOLD LAUFER

CONTENTS

	PAGE
Introduction	215
Ancient Views on Amber	217
Hsi Amber	222
Distribution of Amber	225
India	225
Tibet	230
Roman Empire	231
Persia	233
Burma	233
Turkistan	239
European Amber in China	241
Imitations of Amber	243

HISTORICAL JOTTINGS ON AMBER IN ASIA

By BERTHOLD LAUFER

Introduction

Among the natural products that are of importance in the solution of archeological problems none has attracted wider attention than amber. While the predominating position held by it in prehistoric Europe and in classical antiquity may now be considered as fairly outlined, only sparse material is as yet available for the history of amber and of the trade in it in connection with Asia. A few remarks on amber have been translated from Chinese sources by Wilhelm Schott [1] and St Julien,[2] the latter of whom did not find much interest in this question.[3] Of similar character is that which is to be found in the book of Fred. Porter Smith.[4]

A. Pfizmaier [5] has translated eleven notes relating to amber, seemingly after the cyclopedia *Yen chien lei han*, without entering into a discussion of the subject. When K. G. Jacob [6] attempted to review the subject of amber in China from an historical point of view, he met with but scant material on which to base his studies, with the exception of some occasional communications made to him by Hirth and Arendt. Also in the latest and able work of F. de Mély and M. H. Courel,[7] which

[1] "Skizze zu einer Topographie der Producte des chinesischen Reiches," *Abhandlungen der Berliner Akademie der Wissenschaften*, p. 266, 361, 1842.

[2] *Industries anciennes et modernes de l'empire chinois*, p. 228, Paris, 1869.

[3] "Nous ne nous étendrons pas sur cette question qui n'offre du reste qu'un intérêt médiocre."

[4] *Contributions towards the Materia Medica and Natural History of China*, p. 12, Shanghai and London, 1871. Compare also A. G. Vorderman in *T'oung Pao*, I, p. 382, 1891.

[5] "Beiträge zur Geschichte der Edelsteine und des Goldes," *Sitzungsberichte der Wiener Akademie, phil.-hist. Cl.*, LVIII, p. 194–197, 1868.

[6] "Neue Studien, den Bernstein im Orient betreffend," *Zeitschrift der deutschen Morgenländischen Gesellschaft*, XLIII, p. 353 et seq., 1889.

[7] *Les lapidaires de l'antiquité et du moyen âge;* Vol. I, *Les lapidaires chinois*, Paris, 1896.

is the most extensive investigation of mineral products from Chinese literature, the problem of amber is only slightly touched on,[1] and the authors are tempted to believe that amber seems to have been little diffused in China.[2] A brief note, of somewhat uncritical character, on the views of Chinese writers regarding the origin of amber, has been published by a Japanese author.[3] I shall not enter into a criticism of it.

Ever since Fritz Noetling,[4] of the Geological Survey of India, published his important researches regarding the amber mines of Burma, and proved that by far the greater part of this mineral[5] is there purchased by Chinese traders and transported into Yünnan province, it has seemed to me essential to search in Chinese documents for any references to this trade, or for confirmation of the provenience of Chinese amber from Burma. Such research has proved this supposition to be correct; and the confirmation of Noetling's investigation from Chinese sources, and the chronological definition of Burmese amber production and Burmese-Chinese amber trade, seem to me one of the chief

[1] Loc. cit., p. li. "On connait tous les problèmes soulevés par la question de l'ambre en Occident . . . Eut-il en Chine, dans l'antiquité, la même valeur commerciale qu'en Occident? Hirth n'a pas examiné la question à ce point de vue: je ne puis m'empêcher de m'y placer, quand il propose comme origine du mot *hou pe*, qui en cantonnais se prononce *fou pak*, l'ἄρπαξ grec dont le ρ tombait nécessairement en passant en chinois."

[2] Ibid., p. lviii.

[3] K. Minakata, "Chinese Theories of the Origin of Amber," *Nature*, LI, p. 294, 1895.

[4] "Das Vorkommen von Birmit (indischer Bernstein) und dessen Verarbeitung," *Globus*, LXIX, p. 217–220, 239–242, 1896. English readers may be referred to a similar article by the same author — "On the Occurrence of Burmite, a New Fossil Resin from Upper Burma" — in *Records of the Geological Survey of India*, XXVI, p. 31–40, 1893; or to J. G. Scott and J. P. Hardiman, *Gazetteer of Upper Burma and the Shan States*, vol. II, pt. I, p. 289–295, Rangoon, 1900.

[5] According to investigations made by Otto Helm of Danzig, it differs in its physical and chemical qualities from the Baltic amber, or succinite, and is, moreover, distinct from any other known fossil resin. Helm, therefore, suggested that it should be named *burmite*. But it is justly remarked in the Gazetteer above quoted, p. 289: "Since, however, the general outward appearance of the two is similar, there seems no reason why the name burmite should be any more generally adopted than the scientific term succinite has been up to the present." For historical and archeological purposes I deem it preferable to speak of *Burmese amber*, which gives the well-known generic term and at the same time denotes the place of its origin.

results of the present paper, for which, in addition, I have extracted everything worthy of note regarding amber that is to be found in the Chinese cyclopedias and in other historical and geographical Chinese works. Where passages from Chinese books without further data are quoted, they are derived from the *T'u shu chi ch'êng*, vol. 570, section on National Economy (*shih huo tien*), book 334, chapter on Amber. Chinese sources give us accounts not only of the amber of Burma, but of that of many other regions. The material is arranged geographically, and in each geographical section chronologically. We treat *seriatim* of the amber in India, Tibet, Persia, the Roman Empire, Burma, Turkistan, and of modern European amber importations into China. But first we give a complete translation[1] of what is written regarding amber in the *Pên ts'ao kang mu*, the great work on natural history by Li Shih-chên (end of sixteenth century), because it reviews all statements on the subject made by medical authorities since the earliest times, and contains no small amount of important geographical and historical data which will serve as a basis for the investigation that follows.

Ancient Views on Amber

The account of the *Pên ts'ao kang mu* reads as follows:

Li Shih-chên says:

"When a tiger dies, its soul (spirit) penetrates into the earth, and is a stone. This object resembles amber, and is therefore called *hu p'o* ('tiger's soul').[2] The ordinary character is combined with the radical *yü* ('jewel'), since it belongs to the class of jewels. The Sanskrit books call it *a-shih-mo-chieh-p'o*.[3]

The *Pieh lu* says:

Amber is produced in *Yung-ch'ang* (see p. 235).

T'ao[4] Hung-ching (A.D. 452–536) remarks:

[1] With the exception only of some passages expounding the medical properties and prescriptions of amber, which are outside the scope of the present paper.

[2] This interpretation is made *ad hoc* to account for the original writing of the apparently foreign loan-word *hu p'o* ('amber') with the characters *hu* ('tiger') and *p'o* ('soul'). This way of writing is followed in the two *Han shu*.

[3] W. Schott (loc. cit., p. 361) identifies this word with Sanskrit *açmagarbha* (emerald), and assumes a confusion of these two precious substances.

[4] In the *T'u shu chi ch'êng* this name is written erroneously *Liu*.

There is an old saying that the resin of fir-trees sinks into the earth, and transforms itself [into amber] after a thousand years. When it is then burned it still has the odor of fir-trees. There is also amber, in the midst of which there is a single bee, in shape and color like a living one. The statement of the *Po wu chi*, that the burning of bees' nests effects its make,[1] is, I fear, not true. It may happen that bees are moistened by the fir-resin, and thus, as it falls down to the ground, are completely entrapped. There is also amber made by boiling chicken-eggs with the roe of the "dark" fish, but this is not genuine [that is, it is fictitious]. Only that kind which, when rubbed with the palm of the hand, and thus made warm, attracts mustard-seeds,[2] is genuine.[3] Nowadays amber comes from foreign countries and is produced in those places where *fu ling*[4] grows; on the other hand, however, there is nobody who

[1] See p. 235, 238.

[2] Pliny says: "When a vivifying heat has been imparted to it by rubbing it between the fingers, amber will attract chaff, dried leaves, and thin bark, in just the same way that the magnet attracts iron."

[3] It is very remarkable that this observation is quite correct. Our own naturalists also have recourse to the magnetic property of amber to distinguish it from spurious productions. O. C. Farrington, in his *Gems and Gem Minerals* (Chicago, 1903, p. 207), remarks: "Celluloid can be distinguished from amber by the fact that when rubbed it does not become electric, and gives off an odor of a camphor instead of the somewhat aromatic one of amber." K. G. Jacob (loc. cit., p. 355), says: "Arendt communicated to me from the twenty-fifth book of the *Shu wu i ming su* (eighteenth century) another foreign word for amber, *tun mou*." In this work, however, as may be seen from *Ko chih ching yüan*, book 33, p. 7 a, the term *tun mou* (written with the characters no. 12221 and 8044 in Giles's *Dictionary*) is quoted from the *Lun hêng*, a book of the famous philosopher Wang Ch'ung (A. D. 27–97), and thus goes back to the first century, that is, the time when the Chinese became familiar with Burmese amber; it may therefore be supposed that this word was derived from some Shan language. The passage of Wang Ch'ung runs thus: "*Tun mou* picks up mustard-seeds, *tun mou* is identical with *hu p'o* = amber." Next to the *Ch'ien Han shu* (p. 225), this is the oldest literary mention of amber, and the first mention in Chinese literature of the magnetic qualities of amber, with which, as is known, the ancients also were well familiar. The Sanskrit term *tṛṇagrāhin* ('attracting grass') proves the same for India, and in Persian and Arabic we have the word *kahrubā* with a similar meaning; in Chinese, thus, *shih chieh* becomes a designation for amber. The priority in the observation of this natural law as regards Asia is secured to the Chinese, and it is by no means necessary to assume that their knowledge regarding this point was derived from the classical West. A keen observer and deep thinker like Wang Ch'ung, who refuted the popular notions of his time as to immortality with the acumen of a modern psychologist (see A. Forke, "Wang-Chung and Plato on Death and Immortality," in *Jour. China Branch Roy. Asiatic Soc.*, XXXI), may very well have been able to find out such a fact for himself.

[4] A false tuber, *Pachyma cocos* Fries (Bretschneider, *Botanicon Sinicum*, pt. III, p. 532–536). Its cinnamon-brown color, and the fact that it grows on fir-trees, are presumably the causes of its being associated with the evolution of amber.

is not aware of the fact that amber may occur in any place, whether there is *fu ling* there or not.[1]

Li Hsün[2] observes:

Amber is a secretion in the wood of the sea-fir. At first it is like the juice of the peach-tree; later it coagulates, and assumes form. Besides, there is southern amber (*nan p'o*), which, however, does not come to us on sea-going junks.

Han Pao-shêng[3] says:

The resin of the liquidambar-tree[4] penetrates into the earth, changes during a thousand years, and thus becomes amber. It is not only fir-tree resin that thus changes, but, generally speaking, it is tree-resins which penetrate into the earth, and all alter in the course of a millennium, and it is not that liquidambar and fir trees exclusively have resin during many years. When bee-nests are burned, the shapes of bees are inside in addition.

K'ou Tsung-shih[5] says:

Nowadays there is amber also among the Western Jung, the color of which is unevenly pale, or brilliantly clear. The amber of the southern regions is deep in color and cloudy. The people of those countries make objects and figures of it by turning it on a lathe.[6] It is said that, when

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[1] The above sentence from the *Pieh-lu*, and the quotation from T'ao Hung-ching, have been translated by E. Bretschneider, *Botanicon Sinicum*, pt. III, p. 537. His translation of the latter passage is as follows: "The ancients say that the *hu p'o* is the resin of the fir-tree, which, being embedded in the soil during a thousand years, turns into amber. When burned, it emits an odor like that of resin. It sometimes incloses insects. An imitation of the *hu p'o* is produced by boiling hen's-eggs with fish-roe. The genuine *hu p'o*, when rubbed between the hands till it becomes hot, will attract straw. Now, all the *hu p'o* in China is brought from foreign countries." It will be noted that the last clause is omitted in this translation; for the rest, this is all that is given by Bretschneider regarding amber, from the *Pên ts'ao kang mu*.

[2] Author of the *Hai yao pên ts'ao*, an account of the drugs of southern countries, in six books, second half of the eighth century. E. Bretschneider, *Bot. Sin.*, pt. I, p. 45.

[3] Author of the *Shu pên ts'ao*, the materia medica of Szŭch'uan province, compiled about the middle of the tenth century. See E. Bretschneider, loc. cit., p. 46.

[4] *Fêng*. Regarding this tree, see Th. Sampson, *Notes and Queries on China and Japan*, III, p. 4–7, 1866.

[5] A celebrated physician of the Sung dynasty, author of the *Pên ts'ao yen i*, published *ca.* 1115 A.D. E. Bretschneider, loc. cit., p. 48.

[6] *Nien*, originally used for the husking of rice by means of a stone roller. Chao Ju-Kua uses this word for the cut glassware of Bagdad (Hirth, *Die Länder des Islam nach chinesischen Quellen*, p. 42, note 3; p. 48, note 3). In Europe, also, amber is worked by turning it on a lathe or by cutting by hand.

in a thousand years *fu ling* is transmuted [into amber], bees and ants will stick to it as if artificially arranged ; but this is not the case with the majority [of amber-pieces].

The *Ti li chi* says :

Hainan and Lin yi (Champa) produce much amber. The resin of fir-trees, filtering into the earth, changes, and is then amber. Around it there are no plants. It extends underground to a depth of at least from five to six feet, and at most from eight to nine feet. There are large pieces of the size of a *hu*.[1] By cutting off its rind, it becomes perfect. This statement is convincing ; but it must be considered that the soil is either suitable or not, and that accordingly the transformation takes place or not. As to the account of the burned bees, I do not know on what evidence it rests.

Su Sung[2] says :

What all people say regarding *fu ling* coincides, although there are slight discrepancies. All agree in stating that it arises from the transformation of fir-resin into *fu ling*, so that the spirit of the *fu ling* is that of the great pine-tree. When the latter is broken or felled without the root being injured, and thus not decayed, its sap flows down and coagulates. It therefore cures the heart and kidneys by pervading them with juice. Now, amber originates thus : When the branches and joints of the pine-tree are still flourishing, they are scorched, especially under the influence of the hot sun. Then the resin flows out of the trunk of the tree, and thickens in large masses on the outside, where the sun strikes it. Thereupon it sinks into the earth, and the juice, moist in the beginning, trickles into the earth for many years, where finally it is preserved only as a lustrous substance. Now it is capable of attracting mustard ; still, however, it keeps its adhesive properties. This is the reason that all sorts of insects stick to it, which happened before the time it penetrated into the ground. There are, accordingly, two substances which are produced out of the pine-tree, but which are each different in their nature. *Fu ling* arises in the female principle, and is completed in the male principle. Amber arises in the male principle, and is completed in the female principle. Both, therefore, cure, regulate, and tranquilize the heart, and stimulate the water.

Lei Hsiao[3] says :

[1] A corn-measure holding five or ten pecks.

[2] A high functionary and distinguished scholar under the Sung dynasty, author of the *T'u ching pên ts'ao*, illustrated materia medica, published between 1057 and 1090. E. Bretschneider, loc. cit., p. 47.

[3] Author of the *P'ao chi lun*, a pharmacology, in the fifth century. E. Bretschneider, loc. cit., p. 41, 42.

Generally, we must follow this division : red fir-tree resin, stone amber, water amber, flower amber, "amber of objects and figures," black (jet) amber (*hsi p'o*), and amber proper (*hu p'o*). Among these, red fir-tree resin is like amber, except that it is dull, in large pieces, and brittle, with streaks extending crosswise. As regards water amber, there are many pieces that are not red, but, rather, light in tinge ; among those which are yellow, there are many with furrowed stripes. Stone amber is heavy like stone, yellow in color, but not fit for use. Flower amber resembles "new horsetails"[1] and the inner part of the pine-tree : it has streaks alternately red and yellow. The "amber of objects and figures" contains objects in its interior, and enters into wonderful relations with the destiny of man. Jet amber is the most excellent of the "figure" ambers. The amber proper is of blood-red[2] color ; rubbed with a piece of cloth and made warm, it can attract mustard-seeds, which is a proof of its genuineness.

Li Shih-chên says :

Amber attracts mustard-seeds, that is, plants in general, and mustard-seeds and grains. The statement of Lei Shih, that it attracts only mustard-seeds, may be an error. The Annals of the T'ang Dynasty contain the fact that in the western regions there is the Kan river in Soghdiana, where the wood of the fir-tree lies in the water, and changes to stone after one or two years. This exactly coincides with the fact that all wood coming from fir and liquidambar[3] trees discharges a secretion into the ground, which changes into amber. This is a universal law. Nowadays there is also amber in Li chiang,[4] in the country of Chin ch'i ('gold teeth'). The statement that *fu ling*, after a thousand years, changes into amber, is also an erroneous tradition. Ts'ao Chao says in his book, *Ko ku yao lun*,[5] that amber is produced with the Western Barbarians (*Hsi Fan*, Kukunor region, and Tibet) and the Southern Barbarians (*Nan Fan*). It is the secretion of the liquidambar-tree that thus changes after many years. The kind the color of which is yellow and beautifully transparent is called *la*

[1] Doubtless the name of some plant, which, however, I have not yet been able to identify.

[2] A color attributed also to Sicilian amber.

[3] The connection of the liquidambar (= liquid amber !) tree with the origin of amber doubtless arose from the semi-fluid resin produced by this tree, identical with the storax or liquid storax of commerce, in Chinese *su ho* (see F. Porter Smith, *Contributions toward the Materia Medica*, etc., p. 187).

[4] Also in the *Ta Ch'ing i t'ung chi*, the Geography of the Chinese Empire of the present dynasty (book 382, p. 5 a), amber is mentioned as a product of *Li chiang fu*.

[5] Written in the beginning of the fifteenth century (see E. Bretschneider, loc. cit., p. 162).

p'o ("wax amber").[1] If the color resembles the red of the fir-resin, and is, moreover, yellow, its name is *ming p'o* ("bright amber"). There is a fragrant kind called *hsiang p'o* ("fragrant" or "incense amber"). The sort produced in Korea (*Kao li*) and Japan (*Wo kuo*)[2] is of a deep-red color. There is another kind called "fir-branches of bees and ants" (*fêng i sung chi*), which is still better.

Hsi Amber

A special kind, called *hsi*[3] amber, is then treated in the *Pên ts'ao*, as follows:

[1] K. G. Jacob (*Zeitschrift der deutschen Morgenländischen Gesellschaft*, XLIII, p. 356, 1889) remarks: "It is interesting that the Chinese mention wax amber just like the Arabs." I think that there is nothing remarkable about this fact, the term "wax" being used simply as a color-designation of world-wide application. Palladius (*Chinese-Russian Dictionary*, p. 483) translates *la p'o*, "light-yellow amber"; Eitel (*A Chinese Dictionary in the Cantonese Dialect*, p. 510 a) the same expression by "sparkling yellow amber"; and Couvreur (*Dictionnaire classique de la langue chinoise*, p. 580 c) by "ambre jaune." Also Pliny (*Hist. Nat.*, 37, 11) speaks of amber of waxen color (cerinum) found in Scythia, and says that white and wax-colored amber was valueless and used merely for fumigating (Blümner, *Technologie und Terminologie*, II, p. 386). Even the naturalists of our own day employ this attribute in the description of certain kinds of amber. G. F. Kunz, for example, in his *Gems and Precious Stones of North America* (New York, 1890, p. 199), says of a species of amber discovered in America that it is wax- or honey-yellow. This proves sufficiently that the coincidence in the terminology emphasized by Jacob is quite a natural incident.

[2] So far as I can see, there are in Chinese literature two references with regard to tribute of amber sent from Japan. In the fifth year of the period *Yung hui* (A.D. 654), corresponding to the Japanese period *Hakuchi* (in Chinese, *Pai chï*, "white pheasant"), under the Emperor Kao Tsung of the T'ang dynasty, the Japanese Emperor Toyoshi-karu-no-Oji (in Chinese, *Hsiao Tëh*, 645–654) despatched a tribute of amber and agate, the piece of amber being defined as being the size of a "peck" (tou). Another gift of amber from Japan is mentioned for the fifth year of the period *Hsi ning*, or A.D. 1072, under the Sung dynasty (*T'u shu chi ch'êng*, vol. 1338, *pien i tien*, bk. 33, *Ji pên pu hui k'ao*, 1, p. 9 a, 14 b). Jacob, loc. cit., refers, in regard to Japanese amber, to E. Kämpfer's *Beschreibung von Japan*, II, p. 470, 1779. O. Münsterberg, *Japanische Kunstgeschichte*, II, p. 89 (Braunschweig, 1906), figures a metal mirror of the Nara epoch, A.D. 709–784, on the back of which flowers and leaves are formed of engraved pieces of mother-of-pearl and red amber. In the recent trade statistics of Japan I do not find reference to amber.

[3] Character no. 4174, in Giles's *Dictionary*. Giles defines the term as "a kind of jet, described as a mineral amber of a clear black color." I have no doubt that the species described in the following is identical with the gagate of the ancients, as it strikingly agrees with the description given of this mineral by Pliny, and with that of jet in our own books on mineralogy. On gagate compare H. Blümner,

Lei Hsiao (fifth century) says:

Hsi is the most excelling of all ambers, hence its designation *hsi p'o*.

Li Shih-chên says:

There is also *hsi* that is produced: its color is deep black, hence its name.

Su Kung (seventh century) says:

According to an old tradition, fir-resin alters into *fu ling* in a thousand years. In another thousand years it becomes amber. In another thousand years it becomes *hsi*. When these two substances are burned they emit the odor of firs. In shape they resemble black jade, and are light. They are produced in the country of the Western *Jung*, where there are places in which *fu ling* occurs. Pieces of these substances which are now obtained in a stony desert three hundred *li* south from Hsi chou [Yar-khoto, near Turfan] are large, measuring a foot square, black, moist, and light. When burned they emit a strong odor.[1] The people of Turfan (*Kao ch'ang*) call it *mu hsi* ("wooden *hsi*"),[2] and the black jade they call *shih hsi* ("stone *hsi*"). Among the stones found in the soil of Kung chou [in Honan?] there are those which, when burned, smell like a fir-tree, in quality equal to that of amber. It is customary to make it into vessels incapable of being burned or broken.[3] I fear that neither these two kinds nor amber are products of fir-resin.

T'ang Shên-wei[4] says:

In the *Liang kung tzŭ chuan*,[5] Nai Kung remarks: "In the plains and stony deserts in the territory of Kiao ho,[6] the soil is dug a hundred

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Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern, III, p. 67, 68, Leipzig, 1884.

[1] Compare Pliny's description of gagate (*Hist. Nat.*, 36, 34): "Niger est, planus, pumicosus, levis, non multum a ligno differens, fragilis, odore, si teritur, gravis." ("It is black, smooth, porous, and light, differs but little from wood, is brittle, and emits a disagreeable odor when rubbed.")

[2] Compare Pliny's "non multum a ligno differens" and the description of jet by O. C. Farrington, *Gems and Gem Minerals* (Chicago, 1903), p. 210: "Jet is a variety of coal which, being compact, takes a good polish, and hence can be used in jewelry. It is a kind of brown coal or lignite, and retaining, as it does, some of the original structure of the wood," etc.

[3] Compare Pliny (loc. cit.): "Fictilia ex eo inscripta non delentur, cum uritur, odorem sulpureum reddit, mirumque, accenditur aqua, oleo restinguitur."

[4] Physician, author of the *Chêng lei pên ts'ao*, compiled in 1108. Bretschneider, loc. cit., p. 47.

[5] Presumably identical with the *Liang ssŭ kung tzŭ chi*, Chronicle of the Four Worthies of the Liang Dynasty (502–566), by Chang Yüeh (667–730). Bretschneider, loc. cit., p. 169.

[6] Capital of Turfan at the time of the T'ang. Chavannes, *Documents sur les Tou-kiue (Turcs) occidentaux*, p. 336 b.

feet deep; below there is *hsi* amber of an extremely pure black, some pieces being as big as a cart-wheel. A powder made from it serves as a remedy for female complaints of the urinary intestines, obstruction of the bowels, and other diseases.

Li Shih-chên says:

Hsi is, of all ambers, that of blackest color,[1] according to the one, because the tinge of the earth colors it with its odors; according to others, it is only one kind of wood, emitting an exudation, which then solidifies. But it is not necessarily thousand-year amber which undergoes this transformation.

Wang Ts'ê-ching says:

Resin, after a thousand years, makes *fu ling; fu ling*, after a thousand years, makes amber; amber, after a thousand years, makes stone-gall (?); stone-gall, after a thousand years, makes *wei hsi* ("sublime happiness" ?). Generally, this is all superstitious[2] talk. One cannot wholly depend on Lei Hsiao, either. As regards its odor and taste, it is evenly sweet, and it is non-poisonous. As regards its medical virtues, the *T'ang pên* (A.D. 650) says: "It re-animates the heart, calms the soul [so as to cause sleep], stops bleeding, produces flesh, and in women cures obstruction of the bowels."

Ch'ên Tsang-ch'i[3] says:

Small boys carry it as an amulet;[4] ground, and dropped into the eyes, it prevents a cataract.

We thus see that the earliest mention of this black substance occurs in the fifth century, and that it was introduced into the pharmacopœia as early as the seventh century. From the Chinese account we learn the fact, not unimportant for the geography of minerals, which, so far as I know, was hitherto unknown to our mineralogists, that gagate, or jet, is, or at least was at a certain time, found near Turfan in Turkistan, and that the Turkish inhabitants of this region were acquainted with it, and probably dug it and sent it to China. This importation

[1] Compare Farrington (loc. cit.): "Jet is sometimes known as 'black amber,' a name not inappropriate when the similarity in origin of the two minerals is considered."

[2] *Shên i;* literally, "strange things about spirits," "supernatural wonders."

[3] Author of the *Pên ts'ao shi i*, "Omissions in Previous Works of Materia Medica." He lived in the first half of the eighth century. Bretschneider, loc. cit., p. 45.

[4] According to Pliny, amber is beneficial to infants, attached to the body in the from of an amulet.

seems to have continued down to the twelfth century, as is evident from the observations of T'ang Shên-wei, who recommends the application of jet in certain diseases of women. He is chronologically the last author quoted by Li Shih-chên who does not appear to have known the substance from personal observation, but who merely reasons on the statements of his predecessors. After the time of T'ang Shên-wei, this mineral disappeared from the market, on account of lack of importation, as we may infer from the quotations given in K'ang hsi's Dictionary (*sub voce*) — one, from the dictionary *Chi yün* (middle of the eleventh century), defining *hsi* as a "beautiful stone of black color" (apparently traceable back to Su Kung); the other from the later dictionary, *Chêng yün*, which explains this word as "black jade," with the remark that the old explanation, "a beautiful stone of black color," is wrong — which may be taken as sure signs that the material then no longer existed in the empire. In the modern materia medica of China, jet does not occur. It is true that Doolittle[1] gives two equivalents for the word "jet: (1) *pu huei mu*, which is a mistake, as this term denotes asbestos; (2) *hei yü*, that is, black nephrite, which seems to be based merely on the above-quoted literary sources, perhaps K'ang hsi.

Distribution of Amber

India

In the *Ch'ien Han shu* ("Annals of the Former Han Dynasty"), written by Pan Ku, who died A.D. 92, and continued and completed by his sister Pan Chao, we hear of amber for the first time in Chinese literature; the term never occurs in the classical texts. This historical work contains an account of the western countries (*Ch'ien Han shu Hsi yü chuan*), which relates that the country of *Ki pin* produces amber (there written with the characters for "tiger's soul"). This geographical name denoted Cashmir at the time of the Han and Wei.[2] Relations between China and Cashmir commenced at the time of the Emperor Wu (140–85 B.C.),

[1] *Handbook of the Chinese Language*, I, p. 269.

[2] Chavannes, *Documents sur les Tou-kiue (Turcs) occidentaux*, St Petersburg, 1903, p. 336; see also Schlegel in *T'oung Pao*, série II, vol. I, p. 329, 1900.

and several embassies were despatched from that country to the Chinese court, the last to the Emperor *Ch'êng* (32–7 B.C.), when intercourse with Cashmir ceased, on account of its inaccessibility, till the Wei dynasty (A.D. 386–532).[1] It cannot be presumed, therefore, that during this short period any trade was begun between China and the remote regions of northwestern India, and, still less, that amber from the latter country, in quantities of any importance, could have reached the Chinese Empire. It is certainly not out of the question that the embassies of Cashmir brought along samples of this product for presentation to the court, though nothing is said definitely in our texts regarding this point. Owing to political and geographical conditions, any extensive trade between the two countries was handicapped at the outset; and I think the view of Palladius,[2] that amber was formerly exported from *Ki pin* to China, cannot be accepted. Still, the Chinese account is of great value, for it proves that amber was known in that part of India during the first century before Christ; and the more so, as ancient Sanskrit literature, at least to my knowledge, seems to be silent on this subject. It is not mentioned in the mineralogical section of the *Nighaṇṭurâja*,[3] although the author of this book, Narahari, was a physician from Cashmir.[4] For the rest, our knowledge of Indian amber is based chiefly on the statements of Pliny, in his *Historia Naturalis*, of which chapter 11 of book 37 is devoted to amber. Pliny there alludes to Indian amber in three passages based on the authority of three different informants. First, he reproduces the statement of Nicias, that amber is found also in India, where it is held as a preferable substitute for frankincense.[5] Second, he says, after Ctesias, that there is in India a river called

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[1] Regarding details, see O. Franke, "Beiträge aus chinesischen Quellen zur Kenntnis der Türkvölker und Skythen Central-Asiens," *Aus dem Anhang zu den Abhandlungen der Königl. Preuss. Akademie der Wissenschaften*, Berlin, 1904, p. 58, 59, 63, 64.

[2] *Chinese-Russian Dictionary*, I, p. 483 b.

[3] Edited and translated by R. Garbe, *Die indischen Mineralien*, Leipzig, 1882.

[4] Ibid., p. vi.

[5] *The Natural History of Pliny*, translated by Bostock and Riley, VI, p. 399, London, 1857.

Hypobarus, a word which signifies "bearer of all good things"; that this river flows from the north into the Eastern ocean, where it discharges near a mountain covered with trees which produce electrum; and that these trees are called *siptachoræ*, the meaning of which is "intense sweetness."[1] His third testimony is the most important, as it shows that amber was traded from India to western Asia. It reads as follows:

> That amber is found in India too, is a fact well ascertained. Archelaus, who reigned over Cappadocia, says that it is brought from that country in the rough state, and with the fine bark still adhering to it, it being the custom there to polish it by boiling it in the grease of a sucking-pig. One great proof that amber must have been originally in a liquid state is the fact that, owing to its transparency, certain objects are to be seen within — ants, for example, gnats, and lizards. These, no doubt, must first have adhered to it while liquid, and then, upon its hardening, have remained enclosed within.[2]

Archelaus, mentioned in this passage, governed Cappadocia as a Roman province under the Emperor Tiberius. The fact that amber was a native product of ancient India is thus confirmed beyond doubt.

On the other hand, while the records of the ancients do not hint at the importation into India of amber from Europe, and while nothing to this effect can be gained from Indian literary sources, it is curious and surprising to note that the matter-of-fact Chinese grant us an opportunity of establishing the fact that such a commercial relation between the imperium Romanum and India existed. If anything, such an example reflects the highest credit on the wonderfully developed historical sense of the Chinese. This notice is found in the *Liang shu*, ("Annals of the Liang Dynasty"), written about A.D. 629 and relating to the period A.D. 502–556.

In A.D. 503 an embassy arrived from India at the court of the Liang with a tribute of native products. In the description of India given in the *Liang shu* it is related that the western part of India holds intercourse with Syria or the Roman Orient (*Ta Ts'in*) and Parthia (*An hsi*), that the trade goes by way of

[1] Ibid., p. 400.

[2] Ibid., p. 402. Compare also Chr. Lassen, *Indische Altertumskunde*, III, p. 32.

the sea, and that there are products of Syria in great number there, like precious objects, coral, *amber*, gold, the jade *pi*, pearls, *lang kan*,[1] saffron (*yü kin*),[2] and storax.[3]

From Chinese sources we learn also that amber was employed in the most northern and eastern parts of India. In the description of Nepal given in chapter 221 of the *Old History of the T'ang Dynasty*, it is related that the king of Nepal adorns

[1] F. De Mély and H. Courel, loc. cit., p. 56, 258.

[2] Bretschneider (*Botanicon Sinicum*, pt. II, p. 232) left the term *yü kin hsiang* undefined. I am led to the conclusion that *yü kin hsiang*, as well as the simple *yü kin*, whatever its meaning may be with regard to native plants, when applied to foreign and particularly to Indian countries, denotes the true *saffron* of India, for the following reasons:

(1) In the description of India given in the *Liang shu*, it is expressly stated that *yü kin* is produced *solely* in *Kï pin*, that is, Cashmir (*T'u shu chi ch'êng*, vol. 1242, *pien i tien*, bk. 58, *T'ien chu pu hui k'ao*, p. 2 b). Now, Cashmir is the classical land famed for the cultivation of saffron, which was and is thence exported to the rest of India, Tibet, and, farther, to Mongolia and China. The industry is very ancient in Cashmir. See W. R. Lawrence, *The Valley of Kashmir*, p. 342–344, London, 1895; also *Mémoires de la société finno-ougrienne*, XI, p. 66–68, 1898, where I have given the history of the distribution of saffron and its various designations.

(2) Hsüan Tsang (St Julien, *Voyages des pèlerins bouddhistes*, II, p. 40, 131) mentions the same plant in the Hindukush and in Cashmir; and I Tsing (J. Takakusu, *A Record of the Buddhist Religion*, etc., p. 128), its occurrence in North India, where Takakusu correctly identifies it with Sanskrit *kuṅkuma*, that is, "saffron," *Crocus sativus* L., but, strangely enough, again contradicts this statement in a footnote, in which he explains *yü kin hsiang* as Japanese golden turmeric, a species of *Curcuma*. Nearly all Chinese, Japanese, Arabic, and Western authors usually confound these two plants, although they are not only distinct species but even belong to quite different families (*Crocus* = *Irideæ*, *Curcuma longa* = *Zingiberaceæ* or *Amomeæ*)

(3) Li Shih-chên, in his *Pên ts'ao kang mu*, gives as the Sanskrit equivalent for *yü kin hsiang* the term *ch'a kü mo* = çakama (Tibetan, *sha-ka-ma*), denoting the saffron of Cashmir. He further refers to Ta Ts'in (western Asia) as the country where this plant is produced, which is quite correct and makes sense only when "saffron" is understood by it, the home of which is in Asia Minor. Compare also Hirth in *Jour. China Branch R. A. Soc.*, XXI, p. 221, 1886. Contrary to the statement of F. Porter Smith (*Contributions to the Materia Medica*, etc., p. 223), that saffron is not procurable in Hankow, I may say that genuine saffron may be obtained there as well as in Peking, in any drug-store; to be sure, not under the name *yü kin* or *yü kin hsiang*, restricted to the written language and not understood by the present Chinese, but under the colloquial term *hung hua*, that is, "red flowers." Saffron is highly valued by the Chinese and is very frequently used by women for menstrual disturbances.

[3] Compare also Hirth, *China and the Roman Orient*, p. 47.

himself with genuine pearls, rock-crystal, mother-of-pearl, coral, and *amber*.[1] And the geographical work, *Ying yai shêng lan*, written A.D. 1416, informs us that amber was a product of Bengal.[2] Thus we can trace the occurrence of amber in India from the first century before Christ down to the end of the middle ages.

Of amber in modern India we have unfortunately no information,[3] and it seems almost as if the ancient natural resources of amber were long since exhausted. To discover the sites of the mines remains a task still to be performed, in which archeologists and naturalists are equally interested. I cannot find any references to the occurrence of amber in Cashmir. Walter R. Lawrence,[4] who wrote the most comprehensive work on this region, has only the following to say regarding economic mineralogy:

> The lapidaries import all their more valuable stones, such as agate, bloodstone, cornelian, cat's-eye, garnet, lapis-lazuli, onyx, opal, rock-crystal, and turquoise, from Badakshán, Bukhárá, and Yarkand. There are, however, certain local stones for ornaments and buttons. These stones are soft, and are incapable of a high polish.

Neither does A. Cunningham[5] enumerate amber among the mineral productions of the country. Lassen, in his *Indische Altertumskunde*, makes no allusion to amber, except the one passage above quoted, derived from Pliny. Neither does it seem to figure in the materia medica, as it does not appear in Jolly's *Medicin*,[6] nor did we come across it in our contributions to the medicine of the Tibetans.[7]

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[1] Sylvain Lévi, "Le Népal, Étude historique d'un royaume hindou," I. *Annales du Musée Guimet, Bibliothèque d'études*, XVII, p. 164, Paris, 1905.

[2] *T'u shu chi ch'êng*, vol. 1242, *pien i tien*, bk. 58, *T'ien chu pu chi shih*, II, p. 1 b.

[3] According to Noetling (*Globus*, loc. cit., p. 241 b), the Indian fossil resins have not yet been investigated.

[4] *The Valley of Kashmir*, pp. 64, 65, London, 1895.

[5] *Ladák, Physical, Statistical, and Historical*, p. 229–237, London, 1854.

[6] *Grundriss der indo-arischen Philologie und Altertumskunde*, III, no. 10, Strassburg, 1901.

[7] Heinrich Laufer, *Beiträge zur Kenntnis der tibetischen Medicin*, two parts, Berlin and Leipzig, 1900. But in the well-known Chinese-Tibetan pharmacopœia

TIBET

In Tibet amber seems to be an article much in use. According to a Chinese account,[1] high and low all wear one or two strings of prayer-beads around the neck; they are made of coral, lapis-lazuli, mother-of-pearl, or even wood; the wealthy wear amber ones, the beads being sometimes as big as cups. Amber appears further among the gifts of tribute sent by the Dalai Lama to the Chinese Emperor,[2] and is mentioned, in another connection, among presents sent to China in the seventeenth century.[3] The Tibetan tribes seem to be, with the Shan, the only ones in Asia among whom amber plays a more extensive ethnographical rôle. The K'amba women in northeastern K'amdo wear a form of head-ornament consisting of a discoidal piece of amber about two inches and a half in diameter, with a coral bead in the center.[4] These amber disks are transported as far as the western parts of Kansuh province, and Rockhill[5] assumes that they are imported from India through Lhasa. The same explorer found amber in rough pieces procurable in Kumbum.[6] No place, to my knowledge, is known in Tibet where amber is actually found. The native designations are not suggestive of an autochthonous occurrence of the material. The usual name for it, *spos shel* (pronounced *pö-shel* or *pö-she*; in Lepcha,[7] *po-she*), means literally "perfumed crystal" (perhaps from the resinous odor which it emits in burning, or even as an indication of a former utilization of amber in the way of incense),

(ibid., p. 11; Bretschneider, *Botanicon Sinicum*, pt. I, p. 104), published by the pharmaceutical firm WAN I-HAO in Peking, amber is listed as a drug, so that this is very likely due to Chinese influence.

[1] W. W. Rockhill, "Tibet," *Jour. Roy. Asiatic Soc.*, p. 225, 1891.

[2] Ibid., p. 244.

[3] Ibid., p. 204.

[4] W. W. Rockhill, *The Land of the Lamas*, p. 184, London, 1891. Idem, *Diary of a Journey through Mongolia and Tibet*, p. 103, Washington, 1894.

[5] *The Land of the Lamas*, p. 60, 110.

[6] W. W. Rockhill, *Diary of a Journey through Mongolia and Tibet*, p. 103.

[7] J. D. Hooker (*Himalayan Journals*, I, p. 122, London, 1855) remarks: "The Lepcha are fond of ornaments, wearing silver hoops in their ears, necklaces of cornelian, amber and turquoise, brought from Tibet, and pearls and corals from the south."

which name, at all events, seems to hint at an importation of the mineral. Another, a literary, designation is *sbur len*, or *sbur long*, which appears simply as a literal translation from the Sanskrit *tṛṇagrāhin* ("attracting straw"). The Tibetan *se-mo-do* is translated by Sarat Chandra Dás,[1] "necklace of amber"; by Jäschke,[2] however, by "a kind of ornament, for example, made of pearls." This term can by no means be a word of Tibetan origin, and I am inclined to suppose that in it we have the original Turkish form of *mu hsi*, which, according to Su Kung, the author of the *T'ang pên ts'ao* (A.D. 650), was the Uighur designation for jet or black amber (see p. 223); the Turkish equivalent for *mu* in *mu hsi*, being Chinese for "wood," is *modo*, so that turkicized it would yield *simodo*, which seems identical with the above Tibetan loan-word *semodo*.

ROMAN EMPIRE

The Chinese were acquainted with the fact that amber was an article used in the Roman Empire. We learn this from two main sources — first from the *Tien lio*, in the words that the country of *Ta Ts'in* (Syria) possesses much amber; and, second, at a much later period, in the Accounts of Western Countries, in the Annals of the T'ang Dynasty (*T'ang shu Hsi yü chuan*), which say that "the soil of *Fu lin*, which is the ancient *Ta Ts'in*, has much amber." The *Tien lio*, as finally proved by Chavannes,[3] is identical with the *Wei lio*, and was written by Yü Huan between A.D. 239 and 265. These are the only two accounts regarding amber in the Roman Orient quoted in the *T'u shu chi ch'êng*, in the chapter on amber. But we see from Hirth's book[4] that the same fact is recorded also in the *Hou Han shu*, which, however, was compiled only in the fifth century, so that the editors of the cyclopedia may have omitted this passage for the reason that they thought it to be a repetition from the *Wei lio*. The other notice is found in the *Chiu T'ang shu*, as well as in the

[1] *A Tibetan-English Dictionary*, p. 1274, Calcutta, 1902.

[2] *A Tibetan-English Dictionary*, p. 575 b, London, 1881.

[3] "Les pays d'occident d'après le Wei lio" (*T'oung Pao*, sér. II, vol. VI, p. 519, 1905).

[4] *China and the Roman Orient*, p. 41.

Hsin T'ang shu.[1] The passages above quoted do not admit of the inference that amber was exported from the Roman Orient to China;[2] their statements are merely restricted to the fact that amber was one of the characteristic products of these western regions.[3] Even granting that the *Hou Han shu* was compiled from documents actually written under the Later Han dynasty (A.D. 25–220), we must admit that before the existence of amber in the antique world came to the ears of the Chinese, they were acquainted with this mineral, first, by means of accounts received from India,[4] and, second, through actual exportation of it from the region of the Shan States into Yünnan (see p. 233 et seq.). Considering this fact, the mere supposition that a trade in amber might have been carried on from Syria to the Far East must lose much of its probability, as Syrian amber, aside from the costliness of all Syrian products, due chiefly to the expense of transportation over the long overland route, could not have competed with the doubtless cheaper Burmese amber, and could hardly have tempted the Chinese to buy. Nor is there to be found in other than historical sources any reference to amber from western Asia except, in going back to the thirteenth century, the single passage in Chao Ju-Kua, who enumerates amber among the products of the West which were brought to Palembang, Sumatra, for transshipment to the Chinese port of Ch'üan chou fu.[5] These articles are stated in a general way to have come from Arabia, so that amber also should be located there, though the vagueness of the wording gives hardly a clew to the tracing of its origin.

[1] Ibid., p. 55, 59.

[2] As, for example, is assumed by H. Nissen, "Der Verkehr zwischen China und dem römischen Reiche," *Bonner Jahrbücher*, XCV, p. 19, 1894.

[3] Taking the sentences in the above accounts in their strictest sense, we cannot fail to notice that the verb *ch'u*, which implies the signification of production as well as of exportation, is not there employed in any case, but that the verb is omitted, so that it seems justifiable to supplement only the copula "there is," "it has," etc.

[4] While the Chinese account of the occurrence of amber in India, particularly in Cashmir, goes back to the first century before Christ, the record regarding the same material in the Roman Orient indubitably refers only to post-Christian times, and in my opinion hardly antedates the third century.

[5] Hirth, *Chinesische Studien*, I, p. 39.

PERSIA

Amber is mentioned also as a production of Persia in the Chinese Annals. This notice occurs first in the *Liang shu*, the Books of the Liang Dynasty (A.D. 502–556), under which an embassy from Persia, with tribute, arrived in 547; second, in the *Pei Wei shu*, or Books of the Northern Wei Dynasty (A.D. 386–532); and, third, in the *Sui shu*, or Annals of the Sui Dynasty (A.D. 589–618).[1] But it is not stated that amber was exported from Persia into China.

BURMA

The fact that the Chinese became acquainted at an early date with what we now call "Burmese amber" is seen from the statement in the Annals of the Later Han Dynasty (*Hou Han shu*),[2] that *Ai lao* produces lustrous pearls and amber. *Ai lao* (probably the same as Laos) is the Chinese name of the ancient Shan kingdom, first appearing in history during the first century of our era, whose dominions once extended far into Ssŭch'uan and Kueichou, embracing nearly the whole of Yünnan and parts of Tonkin and Kuanghsi.[3]

In Parker's translation[4] of the account of the country of the *Ai lao*, from the *Hou Han shu*, the passage is given in extenso, and the production of *amber* there appears together with copper, iron, lead, tin, gold, silver, bright pearls, crystal, oyster-pearls, kingfishers, rhinoceroses, elephants, baboons, and tapirs.

In the *T'ang shu*,[5] it is said regarding the *Nan chao*, the descendants of the *Ai lao*, that the nobles ornament their ears with

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[1] *T'u shu chi ch'êng*, vol. 1242, *pien i tien*, bk. 56, *T'iao chi pu hui k'ao*, p. 2 a, 3 a, 4 a.

[2] In the Account of Eastern Barbarians (*Tung i chuan*).

[3] See E. H. Parker, "The Early Laos and China," *China Review*, XIX, p. 67–106, 1890, and "The Old Thai or Shan Empire of Western Yünnan" (ibid., XX, p. 337–46), where its history is given from Chinese sources. G. Devéria, *La frontière sino-annamite*, p. 117, Paris, 1886; E. Rocher, "Histoire des princes du Yunnan," *T'oung Pao*, X, p. 19, 1899. See also A. v. Rosthorn, *Die Ausbreitung der chinesischen Macht in südwestlicher Richtung*, p. 42 et seq., Wien, 1895.

[4] *China Review*, XIX, p. 70 a.

[5] Ibid., p. 76 b.

pearls, green-stone, and *amber*,[1] which shows that amber was actually used by the Shan.

I think that the first acquaintance of the Chinese with this amber may date from the first century of our era, when their relations with Yünnan and its manifold tribes became more intimate. During the following centuries the references in Chinese literature to the amber of this region become more frequent, and we see that the amber utilized in China was actually supplied from the region named, and is located in such places of southern Yünnan as are near the Burmese frontier, along the ancient trade-route leading from Burma to southwestern China.[2]

The first dictionary that alludes to the location of this amber is the *Kuang ya*,[3] which contains the following passage:

Amber is a pearl.[4] Above and beside it, no plants grow. The least depth [in which it occurs in the soil] amounts to five feet; the greatest depth is from eight to nine feet. It is as big as a *hu* [a measure holding ten pecks]. By cutting off the rind, the amber is obtained. At first it is like the gum of the peach-tree;[5] but by being stiffened and hardened it assumes form. The people living in that district work it into head-pillows. It is produced in *Po nan hsien*.[6]

[1] Compare also Parker in *China Review*, XX, p. 341 a. This is the first historical reference to the *nadonay*, cylindrical ear-plugs of amber, still worn by the Kachin tribes, and mentioned by Noetling in *Globus*, loc. cit., p. 240 b, 241 a.

[2] Regarding this commercial highway, see C. Ritter, *Erdkunde von Asien*, III, 2d ed., p. 746–51, Berlin, 1834. G. W. Clark, *Kweichow and Yünnan Provinces*, p. 16 et seq., Shanghai, 1894. Other articles traded from Burma to Yünnan are nephrite, rubies, and cotton. Since the British occupancy of lower Burma, the importance of this ancient route is gradually waning, as goods now sent by steamer from Rangoon to Canton, and thence forwarded by boat to Pai sêh, and farther by horse, reach Yün nan fu, the capital of the province, in two months, while the average time for a caravan from the capital to Mandalay, Maulmain, or Rangoon, and back, is about four and a half months.

[3] A dictionary by Chang I (about A.D. 227–240), E. Bretschneider, *Botanicon Sinicum*, pt. I, p. 164; according to T. Watters (*Essays on the Chinese Language*, p. 38, Shanghai, 1889), published about A.D. 265. This passage from the *Kuang ya* is quoted in the *P'ei wên yün fu*, bk. 100 b, p. 220 a, as a commentary on the above passage of the *Hou Han shu*.

[4] This idea is presumably based on the ancient and universal custom of fashioning amber into beads.

[5] Compare Pliny (translation of Bostock and Riley, VI, p. 401): "Amber is produced from a marrow discharged by trees belonging to the pine genus, like *gum from the cherry*, and resin from the ordinary pine."

[6] In the Han period, the name of Lan chou or Yung ch'ang fu in Yünnan. The

The introduction into a dictionary of the facts just cited proves that amber was then generally known, and that trade in the product from Yünnan into the remainder of China had been carried on for a certain length of time.

The *Po wu chi*, or Records of Remarkable Objects, in its section on medicines, states that the *Shên hsien chuan* (Biographies of Taoist Immortals),[1] says:

> The resin of the pine-tree and the cypress penetrates into the earth, and changes in a thousand years into *fu ling*. *Fu ling* changes into amber. Amber (*hu p'o*) is the same name as river-pearl (*kiang chu*). Nowadays *fu ling* grows on the T'ai shan,[2] but there is no amber there. In Yi chou, in Yung ch'ang fu (Yünnan province), amber is produced, but there is no *fu ling* there. Some people assert that it is by burning bees' nests that [amber] is made. There is as yet no explanation for these two [divergent] statements.

That amber is produced in Yung ch'ang is further stated in one of the oldest works on materia medica, the *Pieh lu*, as quoted in the *Pên ts'ao kang mu*. This is a book frequently referred to by T'ao Hung-ching (A.D. 452–536), and was the standard work of eminent physicians in the Han and Wei periods, as is indicated chiefly by the geographical names mentioned in it, which are invariably those used during that age.[3] It is quite possible that the *Pieh lu* existed in literary form at an earlier date than the *Kuang ya*, and certainly earlier than the *Hou Han shu*, so that it might claim priority in recording the Burmese-Yünnan amber.

The earliest European account of Yünnan amber is given, so

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two districts of Ai lao and Po nan, with parts of I chou, were united into the prefecture of Yung ch'ang in A.D. 69.

[1] As the *Po wu chi* was written by Chang Hua (A.D. 232–300) in the latter part of the third century (Wylie, *Notes on Chinese Literature*, p. 192; Bretschneider, *Botanicon Sinicum*, part I, p. 181), and as Ko Hung, author of the *Shên hsien chuan*, wrote early in the fourth century (Wylie, loc. cit., p. 219; according to Bretschneider, loc. cit., p. 42, he died A.D. 330), the above quotation in the *Po wu chi* from the *Shên hsien chuan* must be considered a later interpolation. This agrees with the remark of Wylie that the *Po wu chi* appears to have been lost during the Sung, and the present work was compiled probably at a later period, from the extracts contained in other publications.

[2] The famous sacred mountain in Shantung, which so early a work as the *Pieh lu* defines as the locality of Pachyma.

[3] E. Bretschneider, *Botanicon Sinicum*, part III, p. 2, 3.

far as I can see, by the Portuguese Jesuit Father Alvarez Semedo, who arrived in China in 1613 and wrote his book on China about 1633 (first published in Rome, 1643). I quote from the English edition,[1] as follows:

> Yunnan is a great countrie, but hath little merchandise, I know not any thing is brought from thence, unlesse it bee that matter, whereof they make the beads for chapplets, which in Portugall they call *Alambras;* and in Castile, *Ambares;* and are like Amber, they are counted good against catarre; it is digged out of mines, and some times in great peices: it is redder than our Amber, but not so cleane.

In another passage of the same work (p. 27), Semedo remarks: "They are very excellent in workes of Ivory, Ebony and Amber."

Old Father DuHalde was familiar also with the fact that the Chinese amber came from Yünnan,[2] and is our witness thereof with regard to the first part of the eighteenth century; nor did Carl Ritter[3] fail to call attention to it.

The fact that the principal supply of amber in the present Chinese market comes from Yünnan province is clearly seen from the reports of the Chinese Imperial Maritime Customs, in which Yünnan is always mentioned as the source of this product.[4] I was personally given the same information, too, when making a collection of Chinese medicines at Hankow in 1903. The specimens of amber there obtained by me are doubtless of Burmese origin.

If the Chinese sources, from the third century, invariably refer to Yung ch'ang as the source of amber, this does not mean that it was produced also in that region, which must be considered as the mere transit mart from Burma to China, as the staple place from which the Burmese goods were distributed over the rest of the country. That this was so in fact, becomes

[1] *History of that Great and Renowned Monarchy of China*, p. 9, London, 1655.

[2] *A Description of the Empire of China* (English transl.), I, p. 122, London, 1738: "It produces red amber, but no yellow. Some think that the rubies and other precious stones are brought hither from the kingdom of Ava." Likewise, Grosier, *Description générale de la Chine*, p. 86, Paris, 1785.

[3] *Die Erdkunde von Asien*, III, p. 754, Berlin, 1834.

[4] *List of Chinese Medicines, Published by Order of the Inspector General of Customs*, no. 488, p. 450, Shanghai, 1889.

evident from the *Ta ch'ing i t'ung chi*, the official geography of the empire, wherein it is stated, in the description of Yung ch'ang (bk. 380, p. 8 b), under the heading of the local products, that the amber of Yung ch'ang "is produced in the soil of all western barbarians of Burma."

In nearly all Chinese writings on Burma the amber production of that country is mentioned. In the *Mien fan hsin chi* ("New Memoirs of the Burmese Frontier"), a brief pamphlet by an unknown author,[1] the gems of Burma are enumerated as follows: kingfisher-colored jade (*fei tsui yü*), topaz, large rubies, large sapphires, cat's-eyes, and various kinds of amber; likewise in the *Mien hsün k'ao lio*,[2] by Kung Ch'ai from Ningpo, who, besides, mentions precious nephrite, ivory, betel-nuts, copper, iron, lead, tin, and stone-oil; further in the *Mien hsün so chi*, by Hsien Shu,[3] etc.

Finally, the fact that Yünnan amber is derived from the amber mines of Burma is confirmed beyond any doubt by the researches of F. Noetling. The center of the amber industry is the village of Maingkhwan, inhabited by Shan, in the district of Myitkyina, which is only about 110 English miles from the city of Yung ch'ang.[4] According to Noetling,[5] by far the larger portion of raw burmite is bought up by Chinese traders, and transported on the route north of Mogung, via Myitkyina, into Yünnan. He supposes that, as the commercial relations of the Yünnanese with the northern part of Burma have existed for a long time, burmite has gone that way for a long time; if burmite was ever an object of trade in antiquity, it certainly found its way to China at that early date. This supposition meets with strong corroboration from the previous research; and we may say that, according to our Chinese sources, the exploitation of the amber mines of northern Burma must date

[1] Reprinted in the Geographical Cyclopedia, *Hsiao fang hu chai yü ti ts'ung ch'ao*, sec. x, bk. 4, p. 224 b.

[2] Ibid., p. 226 b.

[3] Ibid., p. 252 a.

[4] Compare the map of Noetling, in *Globus*, loc. cit., p. 219, and Bretschneider's Map of China.

[5] Loc. cit., p. 241 a.

back at least to the first century of our era, if indeed they were not worked in times far anterior to the advent of the Chinese in these regions.

Though there is no doubt that the so-called amber of Yung ch'ang is of Burmese provenience, there are two places in the province of Yünnan to which an indigenous production is ascribed. The one is Li chiang fu, which we found quoted as such in the *Pên ts'ao kang mu*, by Li Shih-chên, and confirmed by the Imperial Geography ; the other is Ning chou, in Lin an fu, as stated in the *Nan Man chi*, or Accounts of the Southern *Man*,[1] which is a work of the time of the Sung,[2] thus :

> In the sand of Ning chou [3] there are cliffs full of bees. When the cliffs collapse, the bees come out of the earth. The people burn them, and make them into amber.[4]

This matter requires further investigation on the spot. It is curious to note that in so full a description of Yünnan as that given by E. Rocher,[5] in which all the mineral resources of the province are discussed, no mention whatever is made of amber.

As regards other places of finds for amber in China proper, few trustworthy accounts can be noted. Hirth [6] quotes from the *Man shu*, a book of the ninth century, that a "mountain of amber" (*hu p'o shan*) is situated eighteen days' journey west of the city of Jung ch'ang, in Ssŭch'uan. In the *Ssŭ ch'uan t'ung chi* — the geographical description of this province, in which all products are carefully enumerated for each prefecture — I can find no statement regarding the occurrence of amber. According to Alexander Williamson,[7] amber is found in Lu ngan fu, province of Shansi ; while in Richthofen's *China*,[8] in which the

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[1] *Man* is a general designation for all non-Chinese tribes of southern and south-western China.

[2] E. Bretschneider, *Botanicon Sinicum*, pt. I, p. 176.

[3] In Lin an fu, Yünnan.

[4] The belief in the production of amber from bees doubtless originated in the finding of insects embedded in pieces of amber.

[5] *La province chinoise du Yün-nan*, 2 vols., Paris, 1879–80.

[6] Quoted by Jacob, loc. cit., p. 356.

[7] *Journeys in North China*, I, p. 160, London, 1870.

[8] Vol. II.

mineral sources of this province are treated in detail, amber is not mentioned. In the *Ko chih ching yüan*[1] a passage is quoted from the *Kuang chi*, a work of the time of the Liang dynasty (A.D. 502–556), as saying that amber is found in Po p'ing, a district in the Tung ch'ang prefecture of western Shantung. As fossil resins are frequent everywhere, these various notices of native amber may be credible; but it must be borne in mind that these finds need not necessarily refer to true amber, but may be related amber-like resins, such as retinite and others; and, further, that in these cases it is doubtless only a question of occasional finds, not of a systematic mining process with a commercial end in view. If this ever were the case, Chinese sources would not be silent on this point. However it may be, it is safe to assume that from the very beginning of the utilization of amber by the Chinese, the principal supply reached them from Burma overland by way of Yünnan.

TURKISTAN

During the middle ages another source for amber was opened to China through her relations with the Turkish tribes of Central Asia. Under the reign of Emperor T'ai Tsu of the Posterior Chou dynasty (A.D. 951–960), in the second month of the first year of the period Kuang shun (A.D. 951), the Uighur (*Hui hu*) of Hsi chou[2] sent as tribute to the Chinese court six large and small lumps of nephrite, one lump of the nephrite called *pi*,[3] nine catties of amber (*hu p'o*), and twenty pieces of great amber (*ta hu p'o*). In the following year, 952 (third month of the second year of the period Kuang shun), the same tribe despatched another tribute, among which were fifty catties of amber.[4] Under T'ai Tsu of the Northern Sung dynasty, in the twelfth month of the period K'ien têh (A.D. 965), the king

[1] Book 33, p. 7 a.

[2] Yar-khoto, near Turfan. See Chavannes, *Documents sur les Tou-Kiue (Turcs) occidentaux*, p. 357, St Petersburg, 1903.

[3] Giles, *Dictionary*, no. 9009.

[4] *T'u shu chi ch'êng*, vol. 547, *shih huo tien*, bk. 185, *Kung hsien pu hui k'ao*, v, p. 8 a.

of the country Yü t'ien (Khotan)[1] sent envoys to China with tribute containing five hundred catties of amber.[2] In the geographical work *Huan yü chi*, published A.D. 976–983, amber is enumerated among the products of Khotan and Samarkand.[3] Also in the Geography of the Ming it appears as a product of Samarkand, together with gold, silver, copper, iron, nephrite, coral, and glass.[4] It is not known to me that amber is found in situ in Turkistan or elsewhere in central Asia; hence we must surmise that it was brought to the Turks from the west.

A clew to the manner in which amber came into the possession of these Turkish tribes is possibly furnished by a passage occurring in the Persian work *Jami ul hikayat*, written by Nur Eddin Mohammed Ufi, of the thirteenth century. He says of the products of China imported thence into Khorassan, at the time following the overthrow of the Samanides:

> All sorts of textiles are found with them [the Chinese], some of which are brought to Khorassan, with marvelous curiosities. Their merchandize consists of resin, incense, and *yellow amber* coming from the country of the Slavs. This is a resin thrown out by the sea of the Slavs.[5]

On the ground of this passage I am inclined to assume that in the middle ages a trade in amber was maintained from Russia, by way of Siberia,[6] to Turkistan, whence it was carried to China,

[1] The passage in the *Shih i chi*, quoted in *Ko chih ching yüan*, bk. 33, p. 7 b, that a certain Han Fang brought from the kingdom of Khotan, as a present, a phenix of amber six feet in height, is doubtless apocryphal.

[2] *T'u shu chi ch'êng*, loc. cit., bk. 187, VII, p. 2 b.

[3] W. Schott, "Skizze zu einer Topographie der Producte des chinesischen Reiches," *Abhandlungen der Berliner Akademie*, p. 371, 372, 1842.

[4] *T'u shu chi ch'êng*, vol. 1242, *pien i tien*, bk. 53, *Ki pin pu hui k'ao*, II, p. 2 a.

[5] Ch. Schefer, "Notice sur les relations des peuples musulmans avec les Chinois," *Centenaire de l'école des langues orientales vivantes*, p. 8, Paris, 1895.

[6] According to Philipp Johann von Strahlenberg (*Das nord- und östliche Theil von Europa und Asia*, p. 332, Stockholm, 1730), some pieces of amber have been found between the Chatanga and Yenisei rivers, toward the Arctic sea, and also in the sandy desert between Mongolia and China. This account is confirmed by the investigations of Fr. Th. Köppen, "Vorkommen des Bernsteins in Russland" (*Petermanns Mitteilungen*, XXXIX, p. 249–253, 1893); an abstract of this article appears in *Nature*, XLIX, p. 181, 1893. According to Köppen, amber occurs along the arctic shores of Russia and Siberia, over wide tracts, more frequently between the mouths of the Ob and the Yenisei, but also farther inland, a hundred versts east from the Yenisei, on Stefatin river, which falls into the Agano, farther on the Cheta, a side-

and that this product was again sent from China to other countries in the west.

In the chapter on the Uighur (*Hui hui chuan*), in the *Sung shih*, there is a reference to a tribute of amber from Kucha. In A.D. 1010, the King of Kucha, Khagan, despatched an envoy, Li Yen-fu, to bring incense, medicine, *hua jui* ("stamens, pistils"), cloth, renowned horses, a one-humped camel, a sheep with big tail, a saddle and bridle with jade ornaments, amber, and *t'ou shih*.[1]

European Amber in China

Finally, it remains to record the importation of amber into China by European nations. S. Wells Williams[2] asserts that the consumption [of amber in China] for court beads and other ornaments is great, and shows that the supply is permanent, for none is brought from Prussia. In a strict sense the last statement may be true in so far as there was hardly ever direct communication between the Baltic coast of Prussia and the shores of China; but, taken in the sense that no Prussian amber ever found its way to China, it is not correct. From two sources it can be shown that the Portuguese traded amber to China at least as early as the eighteenth century, very probably much earlier; and there can be no doubt that they had shipped this amber from Europe.[3] In the sixty-fourth chapter of the *Chinese Gazetteer of the Province of Kuangtung*, there is a brief summary

stream of the Chatanga, where it is dug by the Yakut, and on lakes Ladannach and Tartach. This Siberian species, however, is very likely not genuine amber, but retinite. As to Russia, amber is found over a vast area, almost uninterruptedly from the Baltic to the Black seas and sporadically in two places in the Caucasus. It seems to me that it was not the inferior Siberian material that was made the object of medieval trade to inner Asia and China, but more probably the highly valued Baltic amber, which alone was of sufficient worth to justify so complicated and expensive a traffic.

[1] *T'u shu chi ch'êng*, vol. 1341, *pien i tien*, bk. 51, *K'ui tzŭ pu hui k'ao*, 1, p. 11 b.

[2] *The Middle Kingdom*, II, p. 398, New York, 1901.

[3] L. Riess, "Geschichte der Insel Formosa" (*Mitteilungen der deutschen Ges. für Natur- und Völkerkunde Ostasiens*, VI, p. 427), states that the Dutch of the seventeenth century imported amber into Formosa among some other articles of trade for further export to China; but nothing seems to be known about the origin of this amber.

of the Portuguese settlement of Macao, in which it is said that the Chinese receive from them in trade, ivory, *amber*, coarse and fine woolen cloths, redwood, sandalwood, pepper, and glass.[1] In the Chinese *Chronicle of Macao*,[2] amber of two kinds, "gold" and "water" amber, is mentioned as being in the possession of the Portuguese. On the occasion of his visit to Canton, amber of European provenience was there observed by Nordenskiöld:

> Ebenso scheint der Bernstein in hohem Ansehen zu stehen, besonders solche Stücke, welche Insekten enthalten. Bernstein wird in China nicht gefunden, aber von Europa eingeführt; derselbe ist oft verfälscht und enthält grosse chinesische Käfer mit den Spuren der Nadeln, auf welche dieselben aufgespiesst waren.[3]

Even in Mandalay the succinite, or Prussian amber, is now easier to procure, and cheaper than the Burmese amber.[4] According to Noetling,[5] succinite has been worked in Mandalay to a large extent since the decrease of the importation of burmite. It is therefore not at all impossible that Prussian amber arrives in China overland by way of Burma. That Prussian amber is imported to Chinese ports appears from the reports of the Chinese Maritime Customs. In *Port Catalogues* of the Chinese Customs Collection at the Austro-Hungarian Universal Exhibition, page 267 (Shanghai, 1873), under the port of Shanghai, Europe and Japan are given as places of production of amber; on page 424, under the port of Canton, the coasts of Prussia, the China sea, and the Indian archipelago are given for the same; and on page 470, again, "the Archipelago, Prussia," etc. I believe that too great stress should not be laid on these statements. They reflect the opinions or general knowledge of the customs officials concerning the provenience of amber rather than give the result

[1] Sir George Th. Staunton, *Miscellaneous Notices Relating to China*, p. 88, London, 1822.

[2] *Ao mên chi lio* (bk. II, p. 39 b), latter part of eighteenth century (Wylie, *Notes on Chinese Literature*, 2d ed., p. 60), but probably earlier, as the preface of one of the two authors, Chang Ju-lin, is dated 1750 (M. Courant, *Catalogue des livres chinois*, I, p. 104, Paris, 1903).

[3] Adolf Erik Freiherr von Nordenskiöld, *Die Umsegelung Asiens und Europas auf der Vega*, II, p. 372, Leipzig, 1882.

[4] *Gazetteer of Upper Burma*, II, pt. I, p. 294.

[5] *Globus*, loc. cit., p. 242b.

of a trustworthy inquiry regarding just those ambers which are imported into China. The statement, "China sea, Indian archipelago, Japan," savors much more of the verbal information given by a Chinese clerk on the customs staff than of authenticated facts. In all probability it is quite impossible to determine the exact source of modern ambers; all we may safely infer is that the ambers of the treaty ports are shipped from abroad and are most likely of German origin.

According to the Returns of Trade of the Chinese Customs (vol. IV, pt. II, p. 410, Shanghai, 1906), 36 piculs of amber from foreign countries, valued at 1033 Haikwan taels, were imported from Hongkong to Canton in 1905.

The amber now used in Korea comes exclusively from Germany. The import from Germany amounted in 1898 to 11,495 yen; in 1899, to 510 yen; in 1900, to 2,111 yen; in 1901, to 5,280 yen.[1]

Imitations of Amber

Regarding imitations of amber, S. Wells Williams[2] remarks that "the Chinese have also learned to imitate amber admirably in a variety of articles made of copal, shellac, and colophony." But the most important of these materials is glass, to which, as is well known, the Chinese understand most eminently how to impart, by means of metal oxides, the most beautiful varied colors, imitating those of jade, malachite, lapis-lazuli, and amber. Rosaries of amber-colored glass beads — manufactured, like all glassware, in Po shan, Shantung province — are frequently used. Very curious is the fact that in Canton, for the manufacture of ornaments, a sort of yellow substance much resembling amber is employed, which is nothing but the upper part of the beak of a crane.[3] A powder of amber, employed in medicine, is much adulterated with colophony and copal.[4]

[1] Handelsbericht des Kaiserlichen Konsulats in Söul für das Jahr 1901, in *Handelsberichte über das In- und Ausland*, Asien, Serie II, no. 36, p. 11, 12, 14, Februarheft, 1903.

[2] *The Middle Kingdom*, II, p. 398, New York, 1901.

[3] *Catalogue of the Chinese Collection of Exhibits at the Paris Exhibition, 1900*, p. 132, Shanghai, 1900.

[4] *Hankow List of Medicines*, p. 18, 1888.

That such fictitious products do not date from yesterday, but are almost as old as amber itself in China, may clearly be seen from the statements of the eminent physicians T'ao Hung-ching and Lei Hsiao, who tested the genuine article by its magnetic properties. The cyclopedia *Ko chih ching yüan*[1] quotes from a treatise *Ts'ai huo yüan liu* ("Sources and History of Wealth"), apparently a treatise on political economy, to the effect that there are many counterfeits of amber, and that only the kind whose color is like that of blood, which, when made warm by being rubbed with cloth, attracts mustard-seeds, is genuine. A curious imitation of amber is described in the *Shên nung pên ts'ao ching*:[2]

> Amber can be made from chicken-eggs by the following method: Take an egg, mix the yolk and white of it, and boil it. As long as it is soft, an object can be cut out of it; this must be soaked in bitter wine for several nights, until it hardens; then rice-flour is added to it.

Whether this fabulous composition was really intended to replace amber may be doubted. In the *T'u shu chi ch'êng*, the same passage is given directly after the *Shên nung pên ts'ao ching*, but without the first and last sentences, above quoted, so that the word "amber" does not appear there. According to the *Ch'i wan lin* ("Forest of Extraordinary Curiosities"),[3] whose statements on amber generally agree with those of the *Ko ku yao lun*, as quoted by Li Shih-chên,[4] counterfeit amber is made of dyed sheep's-horn.

NOTE. — Objects made of amber, as described in Chinese sources, and after actual specimens, will be treated in a separate paper.

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[1] Book 33, p. 7 a.
[2] *Ko chih ching yüan*, loc. cit.
[3] Ibid.
[4] See p. 221.

THE NUMERICAL PROPORTIONS OF THE SEXES AT BIRTH

BY

JOHN BENJAMIN NICHOLS

CONTENTS

PAGE

Categories 249
Source and Character of Data 250
Proportions of the Sexes of Infants born Living 256
Proportions of the Sexes of Infants Stillborn 265
Period of Gestation 267
Cause of Preponderance of Male Stillbirths 267
Antenatal Death Rates of the Sexes 269
Postnatal Death Rates of the Sexes 271
Relation of Proportion of Stillbirths to Sex Ratios of Living Births 273
Proportions of the Sexes of Infants in Total Births (Living- plus Still-born) ... 275
Period at which Sex Determination Takes Place 276
Sex-proportions at Birth according to Legitimacy 276
Arithmetical Fluctuations in Sex Ratios according to Numbers of Births 284
Variation with Time (Decades) in Sex Ratios 289
Influence of Sanitary Environment on Ratios of the Sexes at Birth 292
Influence of Birth Rates 293
Comparative Ratios of the Sexes at Birth in City and Country 294
Effect of War on Sex Ratios at Birth 295
Ratios of Sexes among Firstborn Children as Compared with the Later Born 296
Ratios of the Sexes at Birth according to the Size of the Families 296
Sex Ratios in Multiple Births 296
References 299

THE NUMERICAL PROPORTIONS OF THE SEXES AT BIRTH

By JOHN BENJAMIN NICHOLS

One of the subjects of interest belonging to the profoundly obscure biological question of sex is that relating to the numerical proportions of the sexes at conception or birth. The subject not only has its own intrinsic interest but is of importance in its bearing on the elucidation of the parental or environmental factors that govern the determination of sex in the embryo, since by a study of variations in the proportions of the sexes at birth under different conditions the influence of those conditions on sex-determination can be inferred.

Categories

In studies of the ratios of the sexes at birth various categories are open to consideration, chiefly the following:

1. Sex ratios among infants born alive.
2. Sex ratios among infants stillborn.
3. Sex ratios in total births (living- plus still-born); that is, at conception or the period when sexual determination and differentiation of the embryo take place.
4. Sex ratios according to proportions of stillbirths.
5. Sex ratios according to legitimacy.
6. Arithmetical fluctuations in sex ratios according to numbers of the births.
7. Variations with time (years and decades) in sex ratios.
8. Sex ratios according to sanitary environment, general death rates, etc.
9. Sex ratios according to general birth rates.
10. Sex ratios according to month of birth.
11. Sex ratios according to race.
12. Sex ratios according to country, nationality, and locality.
13. Sex ratios according to climate.

14. Sex ratios according to ages, vigor, cross-breeding, etc., of the parents.
15. Sex ratios according to duration of the marriages.
16. Sex ratios according to social and financial condition, occupation, religion, etc., of parents.
17. Comparative sex ratios at birth in city and country districts.
18. Effect of war, pestilence, national calamities, emigration, etc., on sex ratios at birth.
19. Sex ratios among firstborn children, as compared with the later born.
20. Sex ratios according to size of the families.
21. Sex ratios in multiple births.

It is the purpose of this paper to consider some of these subjects on the basis of extensive data, and especially the influence of the preponderating male mortality in the intrauterine period on the sex ratios of living and stillborn infants. Other categories will be touched on briefly or sufficiently only to point out further lines of investigation that are open.

Source and Character of Data

The data on which studies of this subject are based are derived chiefly from genealogical records, ecclesiastical records, and state or municipal registries of vital statistics.

Genealogical records afford useful data concerning certain classes (aristocracy, gentry, etc.), but are of limited extent.

Ecclesiastical or parish registers in some countries, prior to the adoption of registration by civil officials, afford extensive data as to births. The primary purpose of these records is to show the baptisms of infants, but in many instances they form a fairly complete register of births; in some places the clergy have been required to record also the births of children who died before or without baptism.

The most extensive and most valuable data for these studies are those collected and registered by civil officials, health officials or registrars of vital statistics, and detailed in their annual or periodical publications. The compilation of a large body of vital statistics, covering series of years or numbers of countries, is a task of magnitude, requiring access to the large number of

original reports containing the data. Numerous compilations of this character have been published from time to time, under various auspices, which greatly facilitate the study of birth statistics.

A most exhaustive compilation of birth statistics has been recently prepared by the Service de la statistique générale of France and published in *Statistique générale de la France — Statistique annuelle du mouvement de la population*, tome XXXIII, 1903. This compilation aims to present a resume of all birth statistics recorded in all the countries in which they have been officially registered, back to the time when registration was begun; it is therefore a nearly complete summary of all the birth statistics ever officially recorded and published in all registration countries, and affords an extremely useful, valuable, and comprehensive basis for studies of natality.

It is on this compilation, together with supplementary and amendatory data from the original and other sources, that the present study is based. The aggregate data which I have obtained from these sources and utilized in this investigation amount to 693,785,722 living births and 13,635,986 stillbirths, or 707,421,708 births in all. As these statistics practically exhaust the data registered to the present time relating to some branches of the inquiry, the conclusions yielded by them with respect to those branches must be of high validity and afford a basis for comprehensive comparison and generalization that cannot be much added to for many years to come.

In the interpretation of natality statistics certain considerations must be borne in mind.

Owing to the less publicity of births compared with that attending the disposal of dead bodies, the satisfactory registration of births is more difficult to accomplish than of deaths. In America especially the birth statistics of the few states and cities attempting to register them are, with the exception of some of the New England states, notoriously defective, a considerable proportion of the births escaping registration. Even the enumeration of births in the United States Census is not altogether reliable. In most of the European countries the statistics of

living births are apparently satisfactorily complete. The main trouble with incomplete birth statistics is that the accurate determination of birth rates, such as the number of births in proportion to the population, is rendered difficult or impossible. For the purpose of determining the ratios of the sexes at birth, however, incompleteness of the birth returns is not a matter of so great consequence, since the presumption is that the sex ratios in the few unrecorded births will be the same as in those registered, and consequently the ratios shown by the latter are in all probability accurately representative of the whole.

In some instances in the statistics here utilized the sex or legitimacy of a very few of the infants was not stated in the returns. These constitute such a minute proportion of the whole that they would not appreciably affect the results, and have been disregarded and omitted in these calculations.

An annoying fault common in some statistical reports is the failure to specify explicitly and plainly whether cases reported as "births" mean living births only, or include stillbirths also. For many purposes the distinction is important, and the rubrics in statistical reports ought to be made clear and definite on this point.

The time within which births are required to be reported to the registration officials varies widely in different countries, from three days in France to three months in England. As these divergences may materially affect the figures, the practice in each country must be considered in interpreting the birth statistics.

As will appear in this study, the bearing of stillbirths and abortions at all periods of pregnancy on the sex ratios is of fundamental importance. If the adequate registration of living births is difficult to achieve, that of stillbirths and abortions presents difficulties far greater. This is especially the case with abortion in the early period of gestation, when the event is much less conspicuous and momentous and the securing of privacy or concealment easier than toward term. In most of the countries attempting to register stillbirths the statistics are obviously or acknowledgedly incomplete, a large proportion escaping regis-

tration ; and it is probable that in very few or no places are the statistics of stillbirths reliably complete. For the mere purpose of determining sex ratios among stillborn children this incompleteness is perhaps not of so great consequence, since those registered in any class of cases may be taken as fairly representative of the whole class. For the purposes of this inquiry however, the proportion of stillbirths to the living births or total births is of vital moment ; and as complete records of all births is necessary to determine this proportion, the statistics now available are incapable of yielding this factor reliably.

The matter is further complicated by the varying requirements as to registering stillbirths, and the varying legal definitions of what constitutes stillbirths, in different countries. For the purposes of this study, stillbirths should comprise all cases (including abortions) in which infants or fetuses at any period of gestation are dead when born, or do not respire after being born ; while living births in the strict sense cover all cases where the infants are alive when born, or breathe after being born, however soon thereafter they may die. In France and other countries following the Code Napoléon, however, infants born alive but dying before the report of the birth is made (which is to be done within three days) are classed as stillborn ; consequently in these countries the statistics of stillbirths include some infants living for one, two, or three days after birth. In some countries where parish registers have served as the repository of birth statistics, infants born alive but dying before baptism have been classed as stillborn. In some places the stillborn and abortions at all periods of gestation are registered, as in Paris ; in others only those fetuses are registered as stillborn that have passed four months' gestation (as Norway), six months (Prussia), seven months (Denmark), or have even reached full term (Austria). In most of the European countries the statistics of stillbirths embrace only fetuses that have passed the sixth month of pregnancy.

From this it will be seen that the classes of cases recorded as stillbirths in different countries are often diverse in character. It is unfortunate for comparative and analytical purposes that

this is the case, and that in scarcely any country are the statistics of stillbirths and abortions sufficiently complete and reliable to enable definite and final conclusions on certain points. It is to be hoped that in the future more adequate and uniform registration of stillbirths and abortions may be accomplished. For the present we must do the best possible with the data available, always remembering their limitations. The stillbirths for each country must be interpreted according to the registration methods of that country; and in view of the incompleteness of the returns the rubric "stillbirths" in the tables here presented should be taken to mean "stillbirths reported," with the understanding that the stillbirths unreported might, if known, possibly modify the figures and ratios.

The diverse methods in vogue in different countries of registering both living and stillbirths may, therefore, materially affect the statistics, and must be considered in their interpretation. The following summary of the regulations in force for reporting of births in the principal countries (taken mainly from Wilmart's report on this subject, and from *Statistique générale de la France*, tome XXXIII) is given to present the information pertinent to this purpose:

MAINE. — Births and stillbirths are to be reported within six days (laws of 1891 and 1895).

MASSACHUSETTS. — From 1836 parents and householders were required to report all births within six months; since 1897 the report has been required within 40 days. Since 1880 physicians and midwives have been required to report births attended by them during each month by the fifth day of the following month. By the law of 1897 stillbirths are required to be reported "forthwith."

RHODE ISLAND. — Births attended during each month are required to be reported by physicians and midwives by the fifth day of the following month; stillbirths are to be reported within 48 hours (*General Laws*, 1896).

CONNECTICUT. — Births attended during each month are to be reported by physicians and midwives during the first week of the following month. Stillbirths are to be reported immediately.

DISTRICT OF COLUMBIA. — Reports of births and stillbirths are to be made within six days.

MICHIGAN. — Supervisors and other local officials are required, between April 10 and June 1 of each year, to collect statistics of births during the previous calendar year (law of 1867).

JAPAN. — Births are required to be reported within ten days.

ENGLAND AND WALES. — Living births are required to be registered within three months from the time of birth. Stillbirths are not registered.

SCOTLAND. — Reports of births are to be made within 21 days. Stillbirths are not registered.

IRELAND. — Birth reports to be made within 42 days. Stillbirths not registered.

FRANCE. — All births are to be reported within three days (Code Napoléon). Infants born alive but dying before the birth is reported are classed with the stillbirths.

SPAIN. — Births are to be reported within three days (law of 1870). The registration of the birth of fetuses of less than six months' gestation is not required. From 1861 to 1870 infants dying before being baptized were classed as stillbirths.

PORTUGAL. — There is no requirement for reporting the birth of fetuses of less than six months.

ITALY. — Births are to be reported within five days.

SWITZERLAND. — All births and all premature births after the sixth month of pregnancy are to be reported within three days (law of 1874). Births of fetuses under six months are not required to be reported. Formerly the records of births were kept by the clergy and showed only infants baptized; later, however, the clergy were required to register stillborn infants and those dying before being baptized under the rubric of "dead unbaptized."

AUSTRIA. — Reports of births are, in general, to be made immediately. According to a decision made April 1, 1870, only stillbirths at term are to be registered. Illegitimate births include those from marriages (religious ceremony) not registered with the civil officials.

PRUSSIA. — Since January 1, 1900, living births have been required to be reported within one week, stillbirths by the following day at latest. According to decree of October 26, 1893, births of all fetuses of over six months' gestation or of more than 32 centimeters' length are required to be reported; fetuses under six months or 32 centimeters or less in length are not to be registered.

BAVARIA. — Births are to be reported within one week (law of 1875). Stillbirths are to be reported, at the latest, by the following day. Report of births of fetuses under six months' gestation is not obligatory.

SAXONY. — The regulations in force are the same as in Prussia.

BELGIUM. — As prescribed by the Code Napoléon, births are to be reported within three days. Infants stillborn and infants born alive but dying before the birth is reported are classed together as stillbirths under the rubric "*présentés sans vie*" (decree of July 4, 1806); since 1881, however, the statistics of stillbirths distinguish between the true stillborn and the infants born alive but dying (on the first, second, or third day)

before registration. Registration of birth of fetuses under six months' gestation is not, in general, made.

LUXEMBURG. — The regulations in force are those prescribed by the Code Napoléon.

HOLLAND. — The same regulations are in force as in Belgium. In the statistics the stillbirths of infants "*présentés sans vie*" are styled "*levenloos angegeven.*"

DENMARK. — Births are to be reported within two days in the cities and eight days in the country (law of 1828). Registration of births of fetuses under seven months is not required.

NORWAY. — Births are to be reported within eight days. Births of fetuses under four months are not recorded.

SWEDEN. — Births are to be registered within six weeks (ordinance of 1887). Registration of stillbirths of all fetuses of over six months' gestation is required.

FINLAND. — Similar regulations.

ROUMANIA. — Births are to be reported within three days (Code Napoléon). Registration of births of fetuses of less than six months' gestation is not required.

PROPORTIONS OF THE SEXES OF INFANTS BORN LIVING

In Table I are presented nearly all the available statistics of living births in all parts of the world, aggregating 693,785,722, showing the numerical proportions of the sexes of human infants born alive.

It is well known that ordinarily there is a slight though constant and decided excess of male over female living births. This excess is brought out in every instance but one in the items of Table I.

The statistics for the United States are scanty and scattered; but in 8,377,527 white births there were an average of 1059 sons born alive for every 1000 daughters; and this may be taken as an approximate average ratio for this country. The ratio for Massachusetts for fifty-one years, 1056, is practically the same as the general average; while the adjacent states of Rhode Island and Connecticut gave ratios of 1043 and 1066. The highest ratio is for Philadelphia (seven years), 1093; while New York City (twelve years) has only 1046.

For European countries the statistics are much more complete and satisfactory. An aggregate of 649,415,411 living

births in all parts of Europe yields an average ratio of 1057 sons for every 1000 daughters; for the decade 1891–1900, 125,394,583 living births give a ratio of 1053. For most countries in Europe the ratios range in the neighborhood of the average. In the southernmost countries of Europe there is a decided general tendency toward a much higher ratio of boys, such as 1132 for Greece (the highest in Europe), 1088 for Roumania, 1082 for Bulgaria, and 1078 for Spain (1103 for 1900–1903); Servia, however, is at the average, 1058, while Italy (1061) and Portugal (1067) are not greatly above. In the northern countries of Europe, on the contrary, the ratio of boys tends rather below the average, although the difference is not nearly so marked as in the case of the southern countries. The ratio for England and Wales is the lowest in Europe, 1041 for 1838–1903, 1036 for 1891–1900. The recent ratio for France (1891–1900) is also low, 1043.

The Mussulman or Arabian population of Algeria gives the ratio of 1191 sons for 1000 daughters, the highest ratio found anywhere; this high rate may be taken into consideration in connection with the high rates of the neighboring southernmost countries of Europe. India, also a tropical country, yields a high rate, 1075. The ratio in Japan, 1047, is below the general average for the white race. The lowest ratio of all is given by the colored race in the United States, 778,443 births yielding the ratio of only 1009.

It thus appears that there is a slight but constant numerical excess of male over female living human births in all parts of the world, the average proportions for the white peoples ranging from about 1053 to 1059 sons for every 1000 daughters. There are slight variations in the ratios in different countries. In countries adjacent to the Mediterranean the ratios of sons are much above the average, while in the north of Europe they are rather lower. The colored race in the United States shows a very low rate, while the Japanese are below the average for the whites. Some inquiry into the causes for these variations in different races and places will be made later.

TABLE I

STATISTICS, BY SEX, OF LIVING BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.	Total Number of Children.	Total Number of Sons.	Total Number of Daughters.
UNITED STATES.				
United States, 1890	1055	1,670,821	857,963	812,858
White	1060	1,448,808	745,614	703,194
Colored	1024	222,013	112,349	109,664
United States, 1900	1049	2,063,386	1,056,291	1,007,095
White	1057	1,790,411	919,941	870,470
Colored	998	272,975	136,350	136,625
Maine, 1895–1903	1049	129,173	66,116	63,057
Massachusetts, 1853–1903	1056	2,439,559	1,253,196	1,186,363
Rhode Island, 1854–1903	1043	337,050	172,033	165,017
Connecticut, 1887–1903	1066	322,907	166,606	156,301
New York City, 1891–1902	1046	771,619	394,573	377,046
Philadelphia, 1890–1896	1093	209,002	109,133	99,869
District of Columbia, September 1, 1874, to June 30, 1902	1049	114,762	58,754	56,008
White	1062	66,441	34,226	32,215
Colored	1031	48,321	24,528	23,793
Michigan, 1871–1902	1073	1,272,705	658,896	613,809
United States, white, aggregate of foregoing figures	1059	8,377,527	4,308,971	4,068,556
United States, colored:				
1880	1003	240,607	120,456	120,151
1890	1024	222,013	112,349	109,664
1900	998	272,975	136,350	136,625
District of Columbia, 1874–1902	1031	48,321	24,528	23,793
Total, colored	1009	778,443	390,926	387,517
SOUTH AMERICA.				
Buenos Ayres City, 1875, 1877, 1878, 1882–1898, 1900–1903.	1037	513,288	261,354	251,934
Buenos Ayres Province outside of City, 1875, 1877, 1878, 1881–1888, 1895–1897	1043	365,561	186,652	178,909
Uruguay, 1890–1901	1055	350,994	180,159	170,835
South America, aggregate of foregoing	1044	1,229,843	628,165	601,678
JAPAN, 1877–1902	1047	30,125,679	15,405,806	14,719,873
INDIA, 1891–1900	1075			
ALGERIA, Mussulman population, 1894–1903	1191	1,109,871	603,249	506,622
AUSTRALIA.				
New South Wales, 1861–1903	1050	1,246,805	638,644	608,161
Victoria, 1889–1903	1049	501,274	256,688	244,586
Queensland, 1861–1903	1046	405,292	207,232	198,060
South Australia, 1882–1903	1048	225,633	115,480	110,153
West Australia, 1887–1903	1050	57,580	29,493	28,087
Australia, total of foregoing	1049	2,436,584	1,247,537	1,189,047
Tasmania, 1891–1903	1064	63,294	32,623	30,671
New Zealand, 1891–1903	1051	249,070	127,641	121,429
Australasia, total of foregoing	1050	2,748,948	1,407,801	1,341,147

TABLE I—*Continued*

STATISTICS, BY SEX, OF LIVING BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.	Total Number of Children.	Total Number of Sons.	Total Number of Daughters.
EUROPE.				
England and Wales, 1838–1903..	1041	50,372,070	25,686,784	24,685,286
" " " 1838–1850..	1049	6,947,400	3,555,955	3,391,445
" " " 1851–1900..	1039	40,606,083	20,695,512	19,910,571
" " " 1891–1900..	1036	9,155,211	4,657,846	4,497,365
Scotland, 1855–1902.....	1053	5,764,310	2,957,210	2,807,100
" 1891–1900.....	1050	1,280,044	655,561	624,483
Ireland, 1864–1903.....	1057	4,925,848	2,531,135	2,394,713
" 1891–1900.....	1056	1,055,020	541,797	513,223
France, 1806–1903.....	1054	92,036,270	47,237,537	44,798,733
" 1806–1850.....	1062	43,090,376	22,193,769	20,896,607
" 1851–1900.....	1048	46,416,530	23,754,496	22,662,034
" 1891–1900.....	1043	8,530,007	4,354,131	4,175,876
Spain, 1858–1870, 1878–1882, 1900–1903	1078	13,425,164	6,964,387	6,460,777
Spain, 1900–1903	1103	2,629,866	1,379,529	1,250,337
Portugal, 1886–1901.....	1067	2,590,213	1,337,138	1,253,075
" 1891–1900.....	1063	1,601,028	824,864	776,164
Italy, 1865–1902.....	1061	39,973,440	20,576,169	19,397,271
" 1891–1900.....	1057	10,987,406	5,645,417	5,341,989
Greece, 1865–1885.....	1132	926,568	491,918	434,650
Switzerland, 1871–1903.....	1048	2,829,122	1,447,575	1,381,547
" 1891–1900.....	1045	879,820	449,603	430,217
Austria, Nov. 1, 1829 to 1901.....	1060	55,188,810	28,399,325	26,789,485
" Nov. 1, 1829, to Oct. 31, 1850	1059	13,365,367	6,873,523	6,491,844
Austria, Nov. 1, 1850, to 1900...	1061	40,861,942	21,032,115	19,829,827
" 1891–1900	1060	9,304,613	4,786,948	4,517,665
Hungary, 1865–1903	1054	26,509,663	13,604,435	12,905,228
" 1891–1900	1054	7,410,366	3,803,347	3,607,019
Prussia, 1816–1850.....	1049	18,389,377	9,415,694	8,973,683
" 1850–1871.....	1050	15,416,076	7,895,170	7,520,906
Bavaria, Oct. 1, 1835, to Sept. 30, 1850.....	1056	2,263,486	1,162,530	1,100,956
Bavaria, Oct. 1, 1850, to 1871 ...	1053	3,516,507	1,803,989	1,712,518
Saxony, 1832–1850.....	1054	1,272,744	652,997	619,747
" 1851–1871	1051	1 857,782	952,121	905,661
German Empire, 1872–1902.....	1053	55,714,276	28,579,484	27,134,792
" " 1891–1900.....	1053	19,002,948	9,748,770	9,254,178
Belgium, 1840–1903.....	1049	10,293,730	5,269,654	5,024,076
" 1840–1850.....	1053	1,437,823	737,582	700,241
" 1851–1900.....	1048	8,267,658	4,231,049	4,036,609
" 1891–1900.....	1047	1,865,443	953,942	911,501
Luxemburg, 1891–1900.....	1048	64,267	32,879	31,388
Holland, 1841–1859, 1861–1903..	1054	8,164,219	4,189,705	3,974,514
" 1841–1850.....	1056	996,611	511,969	484,642
" 1851–1859, 1861–1900.	1054	6,660,392	3,417,034	3,243,358
" 1891–1900.....	1052	1,583,611	811,789	771,822
Denmark, 1851–1903.....	1051	3,172,855	1,625,888	1,546,967
" 1891–1900.....	1053	694,107	356,093	338,014

TABLE I—*Concluded*

STATISTICS, BY SEX, OF LIVING BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.	Total Number of Children.	Total Number of Sons.	Total Number of Daughters.
EUROPE.				
Norway, 1841–1902	1057	3,344,806	1,718,608	1,626,198
" 1841–1850	1051	406,288	208,236	198,052
" 1851–1900	1057	2,807,049	1,442,633	1,364,416
" 1891–1900	1063	631,159	325,173	305,986
Sweden, 1751–1900	1049	14,471,520	7,407,938	7,063,582
" 1751–1800	1046	3,465,937	1,771,807	1,694,130
" 1801–1850	1046	4,496,090	2,298,414	2,197,676
" 1851–1900	1052	6,509,493	3,337,717	3,171,776
" 1891–1900	1057	1,338,726	687,994	650,732
Finland, 1751–1900	1043	6,990,688	3,568,181	3,422,507
" 1751–1800	1032	1,248,838	634,221	614,617
" 1801–1850	1037	2,219,503	1,129,842	1,089,661
" 1851–1900	1050	3,522,347	1,804,118	1,718,229
" 1891–1900	1054	817,369	419,509	397,860
Russia, European (Finland not included) 1801–1833	1096	49,656,183	25,960,115	23,696,068
Russia, European (Finland not included) 1861–1865, 1867–1900	1052	147,902,717	75,835,942	72,066,775
Russia, European (Finland not included) 1891–1900	1054	44,550,397	22,864,583	21,685,814
Bulgaria, 1891–1900	1082	1,364,823	709,203	655,620
Servia, 1861–1903	1058	3,258,762	1,675,153	1,583,609
" 1891–1900	1057	969,931	498,405	471,526
Roumania, 1863–1903	1088	7,759,115	4,042,465	3,716,650
" 1891–1900	1064	2,308,287	1,190,028	1,118,259
Europe, aggregate of foregoing	1057	649,415,411	333,731,329	315,684,082
Europe, for the most part, 1891–1900	1053	125,394,583	64,317,882	61,076,701
Aggregate for white race, Europe, United States, Australasia, South America	1057	661,771,729	340,076,266	321,695,463
Aggregate for all races, white, colored, Japanese, Algerians	1057	693,785,722	356,476,247	337,309,475

NOTES.—(A) All dates in all the tables are inclusive.

(B) In some of the statistics for whites in the United States an insignificant proportion of colored births is included, much too small to affect the general result.

(C) The statistics of colored births in the United States embrace chiefly persons of negro descent (probably over 96 percent), with a small proportion of Mongolians and Indians.

(D) In the totals for the United States the figures for the census years are not duplicated.

TABLE II

STATISTICS, BY SEX, OF LIVING- AND STILL-BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.			Number of Still-births in 1000 Total Births.	Average Annual Death Rate per 1000.	Average Annual Birth Rate per 1000.	Children Living Born.		Children Stillborn.		Total Born (Living- + Still-born).	
	Living Born.	Still-born.	Total Born.				Male.	Female.	Male.	Female.	Male.	Female.
UNITED STATES.												
Maine, 1895–1903	1049	1338	1059	42	16.2	21.2	66,116	63,057	3,235	2,418	69,351	65,475
Massachusetts, 1853–1903	1056	1497	1067	30	19.1	26.7	1,253,196	1,186,363	45,169	30,163	1,298,365	1,216,526
Rhode Island, 1854–1903	1043	1395	1054	38	18.2	25.2	172,033	165,017	7,725	5,536	179,758	170,553
Connecticut, 1887–1903	1066	1429	1078	40	17.1	23.5	166,606	156,301	7,985	5,589	174,591	161,890
New York City, 1891–1902	1046	1387	1065	64	20.4		394,573	377,046	30,760	22,180	425,333	399,226
Philadelphia, 1890–1896	1093	1281	1100	40	21.0		109,133	99,869	4,828	3,769	113,961	103,638
Michigan, 1874–1897	1074	1434	1080	22	9.5	22.4	502,457	467,670	12,565	8,760	515,022	476,430
District of Columbia, Sept. 1, 1874 to June 30, 1902	1049	1240	1066	97	22.8		58,754	56,008	6,806	5,490	65,560	61,498
White	1062	1232	1073	65	18.3		34,226	32,215	2,530	2,053	36,756	34,268
Colored	1031	1244	1058	138	32.3		24,528	23,793	4,276	3,437	28,804	27,230
United States, white, aggregate of foregoing	1059	1427	1070	36			2,698,340	2,547,538	114,797	80,468	2,813,137	2,628,006
SOUTH AMERICA.												
Buenos Ayres City, 1890–1894, 1896–1898, 1900–1903	1035	1309	1046	45	21.3	41.4	174,263	168,425	9,076	6,933	183,339	175,358
Buenos Ayres Province outside of City, 1885, 1895, 1897	1046	1384	1055	32	16.9	37.5	50,665	48,456	1,898	1,371	52,563	49,827
Uruguay, 1896, 1899–1901	1056	1267	1063	30	13.8	34.4	63,706	60,306	2,149	1,696	65,855	62,002
South America, aggregate of foregoing	1041	1312	1051	39			288,634	277,187	13,123	10,000	301,757	287,187
JAPAN, 1886–1902	1047	1070	1049	80	20.8	30.0	10,974,822	10,480,037	970,495	906,807	11,945,317	11,386,844
ALGERIA, Mussulman population, 1894–1903	1191	1289	1192	16			603,249	506,622	9,869	7,656	613,118	514,278

TABLE II—*Continued*

STATISTICS, BY SEX, OF LIVING- AND STILL-BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.			Number of Still-births in 1000 Total Births.	Average Annual Death Rate per 1000.	Average Annual Birth Rate per 1000.	Children Living Born.		Children Stillborn.		Total Born (Living- + Still-born.)	
	Living Born.	Still-born.	Total Born.				Male.	Female.	Male.	Female.	Male.	Female.
EUROPE.												
France, 1840–1903	1049	1433	1063	42	22.9	25.1	30,478,117	29,048,285	1,555,688	1,085,875	32,033,805	30,134,160
" 1840–1850	1056	1441	1067	34	23.3	27.4	5,434,349	5,146,159	219,681	152,423	5,654,030	5,298,582
" 1851–1900	1048	1436	1056	44	23.0	24.8	23,754,496	22,662,034	1,266,911	882,510	25,021,407	23,544,544
" 1891–1900	1043	1369	1056	46	21.5	22.2	4,354,131	4,175,876	238,961	174,662	4,593,092	4,350,538
France, 1898–1902 :	1042	1345	1054	45			2,153,793	2,067,716	114,656	85,219	2,268,449	2,152,935
Urban	1044	1281	1056	53			886,740	849,142	55,011	42,948	941,751	892,090
Rural	1040	1411	1052	39			1,267,053	1,218,574	59,645	42,271	1,326,698	1,260,845
France, 1886–1902 :	1043	1382	1056	46			7,476,666	7,169,315	409,780	296,464	7,886,446	7,465,779
Paris, 1886–1902	1037	1328	1056	77			518,026	499,781	48,096	36,229	566,122	536,010
Remainder of France, 1886–1902	1043	1390	1056	44			6,958,640	6,669,534	361,684	260,235	7,320,324	6,929,769
Spain, 1861–1870	1067	1614	1073	12	30.1	37.6	3,133,343	2,935,939	46,237	28,644	3,179,580	2,964,583
" 1878–1882	1083	1447	1087	13	30.6	36.5	1,584,370	1,463,058	24,160	16,695	1,608,530	1,479,753
" 1900–1903	1103	1474	1111	24	27.7	34.9	1,379,529	1,250,337	39,075	26,520	1,418,604	1,276,857
" total of above	1079	1523	1085	15			6,097,242	5,649,334	109,472	71,859	6,206,714	5,721,193
Portugal, 1888–1901	1064	1292	1066	11			1,169,259	1,099,035	14,229	11,015	1,183,488	1,110,050
" 1891–1900	1063	1293	1065	11	21.3	30.6	824,864	776,164	9,608	7,432	834,472	783,596
Italy, 1865–1902	1061	1318	1068	33	27.3	36.5	20,576,169	19,397,271	785,174	595,949	21,361,343	19,993,220
" 1891–1900	1057	1288	1065	40	24.2	34.9	5,645,417	5,341,989	257,687	200,014	5,903,104	5,542,003
Switzerland, 1871–1903	1048	1329	1058	39	21.0	29.0	1,447,575	1,381,547	64,695	48,687	1,512,270	1,430,234
" 1891–1900	1045	1323	1054	36	19.0	28.1	449,603	430,217	18,555	14,028	468,158	444,245
Austria, Nov. 1, 1829 to 1901	1060	1319	1065	22	30.8	38.1	28,399,325	26,789,485	706,618	535,937	29,105,943	27,325,422
" Nov. 1, 1829 to Oct. 31, 1850	1059	1373	1062	13	32.7	38.2	6,873,523	6,491,844	104,592	76,186	6,978,115	6,568,030
Austria, Nov. 1, 1850 to 1900	1061	1310	1066	25	29.9	38.1	21,032,115	19,829,827	586,545	447,748	21,618,660	20,277,575
" 1891–1900	1060	1319	1066	29	26.6	37.1	4,786,948	4,517,665	155,368	117,818	4,942,316	4,635,483

TABLE II—*Continued*

STATISTICS, BY SEX, OF LIVING- AND STILL-BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.			Number of Still-births in 1000 Total Births.	Average Annual Death Rate per 1000.	Average Annual Birth Rate per 1000.	Children Living Born.		Children Stillborn.		Total Born (Living- + Still-born).	
	Living Born.	Still-born.	Total Born.				Male.	Female.	Male.	Female.	Male.	Female.
Hungary, 1876–1903	1054	1294	1058	19	32.0	42.5	10,429,694	9,899,701	220,135	170,154	10,649,829	10,069,855
" 1891–1900	1054	1308	1059	22	29.9	40.6	3,803,347	3,607,019	93,589	71,530	3,896,936	3,678,549
Prussia, 1816–1850	1049	1345	1059	36	27.7	39.2	9,415,694	8,973,683	391,764	291,171	9,807,458	9,264,854
" 1851–1871	1050	1308	1059	41	27.4	37.8	7,895,170	7,520,906	372,635	284,812	8,267,805	7,805,718
Bavaria, Oct. 1, 1835 to Sept. 30, 1850	1056	1371	1064	30	28.0	34.1	1,162,530	1,100,956	40,634	29,636	1,203,164	1,130,592
Bavaria, Oct. 1, 1850 to 1871	1053	1352	1062	33	29.0	35.1	1,803,989	1,712,518	68,073	50,368	1,872,062	1,762,886
Saxony, 1832–1850	1054	1362	1066	46	28.4	38.8	652,997	619,747	35,409	26,007	688,406	645,754
" 1851–1871	1051	1331	1062	44	27.8	40.0	952,121	905,661	49,216	36,964	1,001,337	942,625
German Empire, 1872–1902	1053	1283	1061	36	24.4	37.4	28,579,484	27,134,792	1,161,837	905,263	29,741,321	28,040,055
" " 1891–1900	1053	1282	1060	32	22.2	36.1	9,748,770	9,254,178	358,424	279,682	10,107,194	9,533,860
Belgium, 1841–1903	1049	1336	1060	45	22.1	30.7	5,198,555	4,957,033	270,655	202,637	5,469,210	5,159,670
" 1841–1850	1053	1356	1064	42	24.3	30.9	666,483	633,198	32,706	24,129	699,189	657,327
" 1851–1900	1048	1337	1060	45	21.8	30.8	4,231,049	4,036,609	222,888	166,762	4,453,937	4,203,371
" 1891–1900	1047	1323	1058	45	19.2	29.0	953,942	911,501	49,924	37,737	1,003,866	949,238
Luxemburg, 1891–1900	1048	1319	1055	33			32,879	31,388	1,231	933	34,110	32,321
Holland, 1841–1859, 1861–1903	1054	1277	1064	49	23.4	34.2	4,189,705	3,974,514	233,654	182,978	4,423,359	4,157,492
" 1841–1850	1056	1270	1066	48	26.2	33.0	511,969	484,642	28,223	22,225	540,192	506,867
" 1851–1859, 1861–1900	1054	1279	1064	49	22.9	34.5	3,417,034	3,243,358	193,356	151,146	3,610,390	3,394,504
" 1891–1900	1052	1278	1061	45	18.4	32.5	811,789	771,822	41,467	32,453	853,256	804,275
Denmark, 1851–1903	1051	1305	1058	32	19.2	31.4	1,635,888	1,556,967	59,854	45,877	1,695,742	1,602,844
" 1891–1900	1053	1258	1058	25	17.5	30.2	356,093	338,014	9,723	7,728	365,816	345,742
Norway, 1841–1902	1057	1297	1064	34	17.3	31.1	1,718,608	1,626,198	66,215	51,065	1,784,823	1,677,263
" 1841–1850	1051	1295	1060	40	18.1	30.7	208,236	198,052	9,471	7,316	217,707	205,368
" 1851–1900	1057	1296	1065	33	17.1	31.2	1,442,633	1,364,416	54,857	42,316	1,497,490	1,406,732
" 1891–1900	1063	1295	1068	26	16.3	30.3	325,173	305,986	9,466	7,307	334,639	313,293
Sweden, 1751–1800	1046	1385	1054	27	27.4	33.8	1,771,807	1,694,130	55,272	39,910	1,827,079	1,734,040

TABLE II—*Concluded*

STATISTICS, BY SEX, OF LIVING- AND STILL-BIRTHS

Place and Period.	Number of Sons for 1000 Daughters.			Number of Still-births in 1000 Total Births.	Average Annual Death Rate per 1000.	Average Annual Birth Rate per 1000.	Children Living Born.		Children Stillborn.		Total Born (Living- + Still-born).	
	Living Born.	Still-born.	Total Born.				Male.	Female.	Male.	Female.	Male.	Female.
Sweden, 1861–1900	1053	1332	1060	29	17.9	29.5	2,726,479	2,588,821	90,867	68,193	2,817,346	2,657,014
" 1751–1800, 1861–1900	1050	1352	1058	28	23.2	31.9	4,498,286	4,282,951	146,139	108,103	4,644,425	4,391,054
" 1891–1900	1057	1302	1063	26	16.1	27 2	687,994	650,732	20,019	15,374	708,013	666,106
Finland, 1878–1902	1054	1281	1059	27	20.6	33.9	1,020,295	968,358	31,220	24,376	1,051,515	992,734
" 1891–1900	1054	1261	1059	27	19.7	32.2	419,509	397,860	12,488	9,903	431,997	407,763
Russia, European, 1884–1899	1055	1376	1056	4			35,469,402	33,613,124	141,819	103,080	35,611,221	33,716,204
" " 1891–1899	1054	1372	1055	4			20,709,513	19,643,131	84,967	61,929	20,794,480	19,705,060
Bulgaria, 1891–1900	1082	1354	1083	5	26.0	39.4	709,203	655,620	3,950	2,917	713,153	658,537
Servia, 1881–1903	1056	1308	1059	13	26.1	43.4	1,104,984	1,046,630	16,177	12,371	1,121,161	1,059,001
" 1891–1900	1057	1347	1060	10	27.0	41.7	498,405	471,526	5,743	4,263	504,148	475,789
Roumania, 1866–1899	1087	1373	1090	14	29.2	38.2	3,320,633	3,055,335	52,383	38,148	3,373,016	3,093,483
" 1891–1899	1065	1422	1069	13	29.8	40.9	1,069,245	1,004,199	16,650	11,711	1,085,895	1,015,910
Europe, aggregate of foregoing.	1056	1342	1063	28			207,957,804	197,001,039	6,598,876	4,916,182	214,556,680	201,917,221
Europe, Continental, for the most part, 1891–1900	1054	1312	1059	22			56,186,825	53,284,887	1,387,820	1,057,421	57,574,645	54,342,308
Aggregate for white race, Europe, United States, South America	1056	1344	1063	28			210,944,778	199,825,764	6,726,796	5,006,650	217,671,574	204,832,414
Aggregate for all races, white, colored, Japanese, Algerians	1056	1302	1062	31			222,547,377	210,836,216	7,711,436	5,924,550	230,258,813	216,760,766

NOTES.—(A) The death rates are the averages of the annual number of deaths for each thousand of population; stillbirths not included.

(B) The birth rates are the averages of the annual number of living births per thousand of population.

(C) In a few instances the death and birth rates do not correspond exactly with the period for which the birth statistics are given, the figures (in most of these cases) for one or two of the recent years not being obtainable. Thus, the death and birth rates given for Belgium, 1841–1903, were really calculated from the rates for 1841–1902. The discrepancies are so slight that it is believed no appreciable or material error has been introduced.

Proportions of the Sexes of Infants Stillborn

In Table II are given the available statistics of stillbirths for the world, *as reported*, with the statistics of the corresponding living births, aggregating 13,635,986 stillbirths and 433,383,593 associated living births. In the main, the stillbirths are of fetuses of more than six months' gestation.

From this it immediately appears that the number of males stillborn is always much greater than that of females stillborn; and there are greater fluctuations in the ratios than in the case of living births.

In Europe among 11,515,058 stillbirths there was an average ratio of 1342 sons for 1000 daughters; the ratio for the decade 1891–1900 was 1312. In most of the European countries the proportion ranges from 1300 to 1400 sons for every 1000 daughters stillborn. Spain gives the highest ratio, 1523; France is also well above the average, 1433. Portugal, the German Empire in recent years, Holland, Denmark, Norway, and Finland, are slightly below the average.

A limited number of stillbirths in the northeastern part of the United States gives a high ratio, 1427. The District of Columbia has a low ratio, 1240, Massachusetts a high ratio, 1497. In Japan ample statistics yield the remarkably low ratio of 1070, a proportion only slightly above that for living births.

In considering these figures the actual and almost necessary incompleteness of the statistics of stillbirths and the diverse requirements for registration in different countries must be taken into account. While this incompleteness and diversity do not, perhaps, greatly affect the sex ratios, they render impossible an accurate computation of the proportion of stillbirths to the total births, and also render difficult comparisons between different countries. The numbers given are as shown by the statistics and must be accepted for what they are worth, bearing in mind the special conditions of registration for each country.

For these reasons it is difficult to draw any reliable deductions as to what influence the proportion of stillbirths to total births may have on the ratio of sons to daughters stillborn. There are some indications, however, that, in general, *the proportion of*

stillbirths bears an inverse relation to the excess of male stillbirths; that is, *the greater the proportion of stillbirths to total births, the less is the ratio of males to females stillborn;* and vice versa. For instance, the District of Columbia with a high proportion of stillbirths (97 per mille) has a low ratio of sons to daughters stillborn (1240 to 1000); while Massachusetts with only 30 stillbirths per mille has the high sex ratio of 1497. The city of Buenos Ayres has 45 stillbirths per mille, with a sex ratio of 1309; while the surrounding province (rural) with a less proportion, 32 per mille, has the higher sex ratio of 1384. Urban France for 1898–1902 had ratios of 53 and 1281, while rural France had 39 and 1411 respectively. Paris for 1886–1902 had ratios of 77 and 1328, the remainder of France of 44 and

TABLE III

STILLBIRTHS BY SEX AND PERIOD OF GESTATION

Period of Gestation.	Paris, 1891–1902.			District of Columbia, Sept. 1, 1874, to June 30, 1902					
				White.			Colored.		
	Males.	Females.	Number of Males for 100 Females.	Males.	Females.	Number of Males for 100 Females.	Males.	Females.	Number of Males for 100 Females.
4th month and under.	8,583	4,877	176	135	93	145	296	242	122
5th month....	2,424	2,001	121	169	114	148	333	219	152
6th month....	4,146	3,535	117	250	225	111	516	416	124
7th month....	5,197	4,376	119	335	293	114	627	513	122
8th month...	4,032	3,277	123	331	312	106	618	550	112
9th month and over...	9,883	7,357	134	1,217	945	129	1,773	1,394	127
Total.....	34,265	25,423	134.8	2,437	1,982	123.0	4,163	3,334	124.9

NOTE.—As the sex of fetuses cannot be easily distinguished until during the third month of pregnancy, the data in this table for the "4th month and under" must refer to the third and fourth months.

1390. The most convincing proof of this inverse relation of the stillbirth-proportion to the sex ratio is perhaps to be found by a comparison of the statistics of legitimate and illegitimate stillbirths, as given in Table VIII; illegitimate stillbirths are invariably more numerous in proportion to total births than are

legitimate, and in practically every instance the ratio of sons to daughters is markedly less in the illegitimate class.

Period of Gestation. — The statistics of stillbirths in Paris and the District of Columbia are classified by the month of gestation, so that for these places the proportions of the sexes of stillborn fetuses at various periods can be given. The statistics and ratios are presented in Table III.

In Brussels the statistics of stillbirths make a distinction between fetuses (after the sixth month) dying before and during the accouchement, as shown in Table IV.

TABLE IV

STILLBIRTHS IN BRUSSELS, 1867–1900, SHOWING TIME OF DEATH OF FETUSES, BY SEX

	Number of Stillbirths.			No. of Males for 100 Females.
	Male.	Female.	Total.	
Premature births (7th, 8th, and 9th months):				
Died before accouchement	2,146	1,965	4,111	109
Died during accouchement	145	117	262	124
Total	2,291	2,082	4,373	110
Births at term :				
Died before accouchement	2,420	1,788	4,208	135
Died during accouchement	598	431	1,029	139
Total	3,018	2,219	5,237	136
Total :				
Died before accouchement	4,566	3,753	8,319	122
Died during accouchement	743	548	1,291	136
Total	5,309	4,301	9,610	123.4

If the statistics in Tables III and IV are representative, it would appear that *the ratio of male to female fetuses born dead is much the highest from the third to the fifth month ; much lower from the sixth to the eighth month ; and at term the ratio again rises.* Also, *of fetuses dying during parturition a larger proportion are male than of those dying prior to parturition.*

The absolute and relative numbers of abortions and stillbirths at the different periods of pregnancy, *as reported*, in Paris, District of Columbia, and Brussels, are given in Table V.

Cause of Preponderance of Male Stillbirths. — Three explanations are open to consideration to account for the much greater

TABLE V

ABORTIONS AND STILLBIRTHS AT DIFFERENT PERIODS OF PREGNANCY

Period of Gestation.	Paris, 1894–1902.		District of Columbia, September 1, 1874, to June 30, 1902.				Brussels, 1891–1900.	
			White.		Colored.			
	Actual Numbers.	Number in 1000 Still-births.	Actual Numbers.	Number in 1000 Still-births.	Actual Numbers.	Number in 1000 Still-births.	Actual Numbers.	Number in 1000 Still-births.
3d month.	12,950	275.2	228	51.6	538	71.8	518	107.5
4th "							782	162.3
5th "	3,401	72.3	283	64.0	552	73.6	740	153.5
6th "	5,655	120.2	475	107.5	932	124.3	112	23.2
7th "	7,014	149.0	628	142.1	1,140	152.1	2,668	553.5
8th "	5,348	113.6	643	145.5	1,168	155.8		
9th or over	12,690	269.7	2,162	489.3	3,167	422.4		
Total.	47,058	1000.0	4,419	1000.0	7,497	1000.0	4,820	1000.0

number of male than of female fetuses and infants born dead: (*a*) The initial numerical preponderance of males; (*b*) the greater proportion of deaths of male fetuses occurring during parturition owing to their larger size; and (*c*) the intrinsically much greater mortality of males than of females in the earliest period of life, both antenatal and postnatal.

It is obvious that *ab initio* the number of males coming into existence is materially greater than that of females; and, therefore, supposing an equal proportional mortality in each sex, the deaths of males in the intrauterine period would exceed those of females in the ratio of their relative initial numbers. The preponderance of male stillbirths is due in part to this cause, but only in minor part; since the proportion of male to female stillbirths is much greater than the initial numerical proportions of the two sexes.

The explanation most commonly suggested for the excess of male stillbirths is that owing to their greater size male fetuses are more subject to injury during the process of parturition, and therefore die in greater numbers during birth than females. That this factor is partly operative is indicated by the Brussels statistics (Table IV), in which the proportion of males to females dying during accouchement is greater than that of those dying previously. But it affects the statistics only in slight degree,

since (*a*) the number of males born dead is much in excess of the females even in the earlier periods of gestation when the fetuses of both sexes are so small that the conditions during birth act practically equally on both ; (*b*) the marked excess of male over female deaths occurs as well during the first few years of life as at birth ; and (*c*) in Brussels the ratio of males to females dying prior to accouchement (and before being subjected to birth injuries) was still high.

Obviously the main cause of the great preponderance of male stillbirths resolves itself into the question of the comparative mortality or death rate of the male and female sexes during the intrauterine period of existence. Vital statistics have shown clearly that there are material differences in the mortality of the two sexes, the death rates among males being, in general, higher than among females throughout nearly the entire period of life, and the average duration of life of females being greater than of males. During the adult and late periods of life this difference is largely or partly explainable on the ground of the greater stress and strain and liability to injury imposed by the greater responsibilities, more laborious occupations, and greater exposure of men, and their greater indulgence in vicious and morbific habits ; these factors scarcely being offset by the perils incurred by women during the childbearing period. But the same greater mortality of males occurs, and in the most marked degree, even in the intrauterine period of existence and in the early years of life before the factors mentioned begin to be operative ; it is therefore obvious that the male constitution is intrinsically weaker, less hardy, and more susceptible to morbific and mortific influences, and has less vitality and resisting power against disease, than the female. The cause of this innate disparity of vitality between the two sexes we do not know ; but the fact that it exists, that the antenatal mortality and death rate of males much exceeds that of female fetuses, accounts for the great excess of male over female stillbirths.

Antenatal Death Rates of the Sexes. — As the death rate of any class at any period of life is computed from the deaths during that period and the total number living at the beginning

of the period, the same method may be applied to the determination of the male and female death rates before birth. On account of the imperfect character of the data of stillbirths, an estimate of the antenatal death rates for the entire period of pregnancy cannot be made; but if the data given in Table II for the countries in which the registration appears most reliable may be assumed as approximately representative of stillbirths of

TABLE VI

DEATH RATES PER 10,000 OF MALE AND FEMALE FETUSES IN UTERO, DURING PERIODS OF GESTATION STATED (CALCULATED FROM THE DATA AS REGISTERED)

Place and Period.	Period of Gestation.	Deaths of Male Fetuses per 10,000.	Deaths of Female Fetuses per 10,000.	Total Deaths of Fetuses per 10,000.	Ratio of Male to Female Death Rate (Male÷Female Rate).
Massachusetts, 1853–1903		348	248	299	1.40
Rhode Island, 1854–1903		430	324	378	1.33
Connecticut, 1887–1903		457	345	403	1.32
New York City, 1891–1902		723	556	642	1.30
District of Columbia, 1874–1902	Over 2nd month				
White		688	599	645	1.15
Colored		1485	1262	1376	1.18
United States, white (as reported)		408	306	359	1.33
Buenos Ayres City, 1890–1903		495	395	446	1.26
Japan, 1886–1902		812	796	805	1.02
France, 1840–1903		486	363	425	1.34
" 1891–1900		520	401	462	1.30
Paris, 1886–1902	Over 2nd month	850	676	765	1.26
Italy, 1891–1900		437	361	400	1.21
Austria, 1891–1900	Term	314	254	285	1.24
German Empire, 1872–1902	Mostly(?)over 6th month	391	323	358	1.21
Belgium, 1841–1903	Over 6th month	495	393	445	1.26
" 1891–1900		497	398	449	1.25
Holland, 1841–1903	Over 6th month	528	440	486	1.20
" 1891–1900		486	404	446	1.20
Denmark, 1851–1903	Over 7th month	353	286	325	1.23
Norway, 1841–1902	Over 4th month	371	304	339	1.22
Sweden, 1861–1900	Over 6th month	323	257	291	1.26
Finland, 1878–1902	Over 6th month	297	246	272	1.21
Europe (aggregate reported)	Mostly over 6th month	308	243	276	1.27
" (for the most part), 1891–1900)	Mostly over 6th month	241	195	218	1.24

fetuses of the age contemplated by the regulations, then the antenatal death rates of males and females at the period of gestation stated would be as shown in Table VI.

The death rates given in this table exhibit considerable diversity in the different countries; this diversity is due partly to the varying periods at which stillbirths are reported, and partly to differences in the registration machinery in the different countries. The actual death rates per 10,000 are in most cases probably higher than shown in this table, on account of the incompleteness of the returns of stillbirths. The ratio of the male to the female death rate (last column) may nevertheless be presumed to be approximately representative of the comparative intrauterine death rates of the two sexes; this ratio corresponds to the

TABLE VII

DEATH RATES PER 10,000 OF MALE AND FEMALE INFANTS FOR FIRST FIVE YEARS AFTER BIRTH

Place and Period.	1st Year (Under 1 Year Old).			2d Year (1 to 2 Years Old).			3d Year (2 to 3 Years Old).			4th Year (3 to 4 Years Old).			5th Year (4 to 5 Years Old).		
	Male Death Rate.	Female Death Rate.	Ratio of Male to Female Rate.	Male Death Rate.	Female Death Rate.	Ratio of Male to Female Rate.	Male Death Rate.	Female Death Rate.	Ratio of Male to Female Rate.	Male Death Rate.	Female Death Rate.	Ratio of Male to Female Rate.	Male Death Rate.	Female Death Rate.	Ratio of Male to Female Rate.
United States (registration area) 1900.....	1837	1468	1.25												
Massachusetts, 1893–1897.....	1723	1470	1.17	422	401	1.05	201	192	1.05	140	139	1.01	108	100	1.08
England and Wales, 1881–1890	1610	1311	1.23	573	527	1.09	238	230	1.03	154	151	1.02	114	110	1.04
Prussia, 1867, 1868, 1872, 1875–1887....	2285	1989	1.15	760	723	1.05	395	386	1.02	263	256	1.03	185	187	.99
Norway, 882–1892	1049	897	1.17	360	348	1.03	220	215	1.02	164	169	.97	136	133	1.02
Japan, 1899–1901....	1756	1592	1.10												

proportions of the sexes in stillbirths corrected to eliminate the total numerical disparity of the two sexes, and runs more nearly uniform than the latter. In general, the male antenatal mortality is about $1\frac{1}{5}$ to $1\frac{1}{3}$ times the female mortality.

Postnatal Death Rates of the Sexes. — This marked excess in antenatal male mortality is followed by a corresponding exces-

sive male mortality in the postnatal period for the first year or two of life. Some typical figures for the comparative male and female death rates for the first five years after birth (taken mainly from Bulletin 14, U. S. Census Bureau, 1904) are given in Table VII.

These figures show that the excess of male over female mortality for the first year after birth (the male mortality being $1\frac{1}{7}$ to $1\frac{1}{4}$ times the female mortality) is nearly as high as during the antenatal period. After the first year the male death rate drops to a point much nearer the female.

It therefore appears that the excessive male mortality during the fetal period is not due to any special intrauterine conditions, but is the manifestation during that period of a general great preponderance in male mortality throughout the first two or three years of human existence. The male starts out in life with a much weaker constitution, a much less vitality and resisting power, and a correspondingly greater mortality and death rate, than the female; and it is to this condition (whatever be its cause) that the great preponderance of male over female stillbirths is chiefly due.

The *inverse relation of the proportion of stillbirths to the excess of males stillborn* (that is, the apparent fact that the greater the proportion of stillbirths the less is the ratio of males to females stillborn, and *vice versa*) may perhaps be explained, partially at least, as follows: If all fetuses died in utero, the ratio of males to females so stillborn would be at the lowest point possible under the conditions, namely, at the proportion in which the two sexes were initially conceived or differentiated. But as the stillbirths diminish from 100 percent of all births to lower and lower percentages, the males from their less vitality and resisting power succumb in increasingly greater comparative numbers than the females to the morbific and mortific influences that become operative in the fetal period. For example, the Massachusetts total births show 3 percent of stillbirths, of which 1497 are of males for every 1000 that are female; supposing, however, that all (100 percent) of the Massachusetts infants should

for some reason be born dead, then the proportion of males to females stillborn would be as only 1067 to 1000. If the transition between these figures were at a uniform rate, then as the percentage of stillbirths increased from 3 to 100, the ratio of boys would decrease from 1497 to 1067, which is the inverse relation under consideration.

Relation of Proportion of Stillbirths to Sex Ratios of Living Births. — Since the proportion of males to females stillborn is much greater than the proportion of the sexes living born, it is obvious from purely mathematical considerations that, other things being equal, *the greater the proportion of stillbirths and abortions the less will be the excess of males over females born alive; and vice versa.* Thus, given two classes of cases in which the initial proportions of the sexes are alike, if in one a larger proportion of stillbirths occurs than in the other, there will be in the former class a less proportion of males to females born alive than in the latter class. The proportion of stillbirths exerts a very decided effect on the ratio of the sexes as born alive; this is shown not only by theoretical considerations but is clearly brought out by the statistics.

Thus, in the District of Columbia the proportion of stillbirths per 1000 is 138 for the colored population and 65 for the white; the number of sons for 1000 daughters is 1062 for the whites, and only 1031 for the colored race, a difference of 31 per thousand. This difference, however, on the face of the statistics, is due largely to the difference in the ratios of stillbirths, since among the total births (living plus stillbirths) the sex ratios among the white and colored are 1073 and 1058 respectively, a difference of only 15.

Also, in Paris for 1886–1902 the sex ratio of living births was 1037, the stillbirths 77 per thousand; while in the remainder of France for the same period the sex ratio was 1043 and the stillbirths only 44 per thousand. On taking the total births into account, however, the sex ratio was the same for both, 1056, showing that in this case the difference in the sex ratios of living births was due entirely to the disparity of stillbirths.

It is obvious from these facts that the proportions of the sexes in living births alone afford an untrustworthy basis for the drawing of conclusions as to the effect of the various concomitant conditions upon the determination of sex. The percentages of stillbirths, in connection with the greater ratio of males in the latter, are also vital and essential elements in the problem, and no valid conclusions can be reached without taking them into consideration; that is, the conditions that apparently affect the proportions of sexes at (living) birth may really act by causing variations in the proportions of abortions and stillbirths. Thus, it has been generally held that there is a natural tendency in the colored race to produce fewer sons than in other races; but this view is based on the statistics of living births alone, whereas it is probable that the difference is due largely if not entirely to the conditions of life among the colored causing a greater proportion of stillbirths and abortions among them (as the District of Columbia statistics indicate). Again, the comparative statistics of living births for Paris and the remainder of France might be interpreted (as similar figures have repeatedly been interpreted) as an indication that urban conditions cause a less generation of males than occurs under rural conditions; whereas the actual fact in this instance is that there is no initial difference, but the circumstances of urban life are such as to cause a larger proportion of stillbirths.

It is therefore absolutely essential to correct deduction that the stillbirths be taken into consideration. In practically all the investigations hitherto made as to sex determination the stillbirths have not been considered, but living births only, or an indiscriminate comparison of living with total (living- plus still-) births, have been utilized as the basis of the studies; all conclusions thus derived are obviously invalidated.[1]

Proportions of the Sexes of Infants in Total Births (Living- Plus Still-born)

For the reasons just stated the essential data in a study of this sort, or required for a proper and adequate study of the in-

[1] The influence of the proportion of abortions on the ratios of the sexes of children born alive has been recognized by Rauber and von Lenhossék.

fluences governing the determination of sex, are the proportions of the sexes at conception or other period when the sexual determination and differentiation of the embryo takes place; or, what amounts to the same thing, the numbers of the sexes in the totality of births — all living births, all stillbirths and abortions, and all unborn (in pregnant mothers dying undelivered), combined. Owing to the incomplete and imperfect registration hitherto of stillbirths and abortions, no such complete statistics of total births of any extent are now available. Until they are available many of the vital and fundamental points relating to sex proportions at birth and the determination of sex must remain unsolved. The obtaining of complete statistics of this sort perhaps presents difficulties insuperable; yet it is an ideal to be worked toward if we are to hope for an adequate settlement of some of the questions under consideration.

In Table II are given the statistics of "total births," or of the combined living and stillbirths *as reported.* While under the circumstances they may not possess much value for final conclusions, they may be interpreted for what they are worth.

In every instance in this table the ratio of males is higher (and usually decidedly higher) in the total births than in the living births, as necessarily follows when the proportion of sons is so much higher than of daughters in the stillbirths. The differences are greater in proportion to the percentages of stillbirths. In general the ratio of males to females in the total births seems to run somewhat parallel to the ratio in the living births in the various countries; but to what extent this parallelism would hold if all the abortions and stillbirths could be included in the statistics — that is, the extent to which the living-birth ratios are an index to the total-birth ratios — is quite indeterminate.

Of the causes of the differences in the sex ratios in reported births in different countries no general explanation is now possible. Differences in the proportions of stillbirths in different places, due to differences in hygienic, social, or moral conditions, doubtless have a material effect on the living-birth ratios; but how far differences in the sex-ratios would disappear if full statistics of the "total births" — or of the initial proportions of

the sexes — could be obtained is problematical. Some variations doubtless arise from differences in the completeness and the methods of registration in different countries. Thus, it has been suggested that the cause of the low ratio of boys born in England (1041) lies in the fact that the long period of three months is allowed for the report of births; many of the infants that die during this period before being registered, it is suggested, are not registered at all; and as a materially larger proportion of these deaths are of boys than of girls, the number of male births recorded is correspondingly reduced. This explanation may possibly account, in part at least, for the low boy-rate in England; yet it is to be observed that in other countries allowing long periods for registration, as in Ireland and Sweden (42 days), a similar effect of a lowered boy-rate is not especially obvious.

For the greater part, however, the differing sex ratios in different countries are not as yet capable of satisfactory explanation.

Period at which Sex Determination Takes Place. — In the human fetus the sex is distinct in the fourth month; the external genitals differentiate during the third month; and the internal sexual organs begin to differentiate about the seventh or eighth week of pregnancy. The determination of sex therefore takes place before the seventh week; and the general trend of opinion at present is that the sex of an embryo is determined at conception, or even before (in the ovule).

Sex Proportions at Birth According to Legitimacy

The observation has been repeatedly made that the proportion of sons to daughters born illegitimate is markedly lower than in the case of those born legitimate, but no adequate explanation of this alleged fact has been forthcoming.

For the purpose of affording a basis for the study of this point the comparative statistics of legitimate and illegitimate living and stillbirths presented in Table VIII have been compiled, covering an aggregate of 41,333,493 illegitimate living births and 1,412,570 illegitimate stillbirths, together with the corresponding legitimate births.

Table VIII

Statistics, by Sex, of Legitimate and Illegitimate Living- and Still-births

Place and Period.	No. of Sons for 1000 Daughters.						No. of Legitimate Still-births in 1000 Total Legitimate Births.	No. of Illegitimate Still-births in 1000 Total Illegitimate Births.	No. of Illegitimate Living Births in 1000 Living Births.	No. of Illegitimate Total Births in 1000 Total Births.	Children Born Alive.				Children Stillborn.			
	Born Alive.		Stillborn.		Total Born.						Legitimate.		Illegitimate.		Legitimate.		Illegitimate.	
	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.					Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
United States.																		
Massachusetts, 1856–1895	1056	1029							14		878,395	832,160	12,114	11,774				
Rhode Island, 1882–1903	1047	988							11		101,794	97,232	1,090	1,103				
Connecticut, 1887–1899						1066												
" 1900–1903	1067	983							11		42,724	40,057	453	461				
District of Columbia, Sept. 1, 1874, to June 30, 1902			1250	1224											4,767	3,802	1,946	1,590
White			1232	1352											2,223	1,804	284	210
Colored			1273	1204											2,544	1,998	1,662	1,380
District of Columbia, 1879–1902							79	217		137								
White							60	212		37								
Colored							110	217		263								
United States, living white births, total of foregoing	1055	1024							13		1,022,913	969,449	13,657	13,338				
South America.																		
Buenos Ayres City, 1887–1898, 1900–1903	1040	1017							139		187,170	179,993	29,902	29,392				
" " " 1890–1894, 1897, 1898, 1900–1902	1042	1012	1328	1313	1052	1027	42	60		144	123,516	118,563	20,138	19,909	6,120	4,610	1,460	1,112
" " Province outside of City, 1875, 1877, 1878, 1881–1888, 1895–1897	1047	1029							221		145,599	139,018	41,053	39,891				
Uruguay, 1896, 1899–1901	1051	1071							259		47,063	44,772	16,643	15,534				
South America, living births, total of foregoing	1044	1033							188		379,832	363,783	87,598	84,817				
Japan, 1890–1901	1050	1022							71		7,310,866	6,965,073	552,069	540,412				
" 1899–1901	1054	1047	1115	1065	1059	1051	79	192		99	2,016,676	1,912,947	194,176	185,307	177,960	159,631	46,556	43,723
Australia.																		
New South Wales, 1879–1902	1051	1037							56		415,424	395,304	24,688	23,802				
Queensland, 1891–1903	1047	1034							56		89,338	85,335	5,233	5,060				
South Australia, 1898–1902	1051	1015							40		22,370	21,287	924	910				
West Australia, 1892–1902	1051	1041							47		20,937	19,924	1,022	982				
Australia, total of foregoing	1050	1036							55		548,069	521,850	31,867	30,754				
Tasmania, 1891, 1892, 1895, 1898–1902	1065	1036							53		18,983	17,832	1,040	1,004				
New Zealand, 1898–1902	1055	1056							45		48,313	45,775	2,257	2,137				
Australasia, living births, total of foregoing	1051	1037							54		615,365	585,457	35,164	33,895				

TABLE VIII—*Continued*

STATISTICS, BY SEX, OF LEGITIMATE AND ILLEGITIMATE LIVING- AND STILL-BIRTHS

Place and Period.	No. of Sons for 1000 Daughters.						No. of Legitimate Still-births in 1000 Total Legitimate Births.	No. of Illegitimate Still-births in 1000 Total Illegitimate Births.	No. of Illegitimate Living Births in 1000 Living Births.	No. of Illegitimate Total Births in 1000 Total Births.	Children Born Alive.				Children Stillborn.			
	Born Alive.		Stillborn.		Total Born.						Legitimate.		Illegitimate.		Legitimate.		Illegitimate.	
	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.					Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
EUROPE.																		
England and Wales, 1842, 1845–1903	1040	1043							52		22,862,118	21,988,490	1,267,475	1,215,077				
" " 1891–1900	1035	1043							42		4,462,914	4,310,495	194,932	186,870				
Scotland, 1855–1902	1053	1061							84		2,709,183	2,573,322	248,027	233,778				
" 1891–1900	1049	1056							71		608,824	580,239	46,737	44,244				
Ireland, 1864–1903	1057	1052							27		2,462,467	2,329,435	68,668	65,278				
" 1891–1900	1056	1052							26		527,497	499,629	14,300	13,594				
France, 1806–1840	1065	1045							68		16,093,106	15,107,329	1,155,738	1,106,082				
" 1841–1869, 1871–1903	1050	1035	1470	1222	1060	1048	40	74		80	27,241,844	25,937,124	2,264,074	2,187,458	1,315,247	894,640	195,620	160,126
" 1806–1903, living births	1056	1038							74		43,781,904	41,470,599	3,455,633	3,328,134				
" 1891–1900	1044	1031	1402	1181	1057	1041	44	72		93	3,973,989	3,807,050	380,142	368,826	207,333	147,882	31,628	26,780
Paris, 1886–1902	1040	1026	1389	1206	1062	1041	73	86		286	372,037	357,557	145,989	142,224	33,340	23,998	14,756	12,231
Spain, 1858–1870	1069	1038							56		3,781,404	3,536,265	219,084	211,117				
" 1878–1882	1083	1082	1463	1339	1087	1087	12	34		47	1,512,057	1,396,028	72,313	67,030	21,377	14,616	2,783	2,079
" 1900–1903	1102	1129	1499	1272	1110	1137	23	53		47	1,315,685	1,193,810	63,844	56,527	35,278	23,535	3,797	2,985
" total of foregoing living births	1079	1061							51		6,609,146	6,126,103	355,241	334,674				
Portugal, 1886–1901	1074	1022							122		1,177,933	1,097,291	159,165	155,743				
" 1891–1900	1071	1005							121		727,412	679,148	97,429	96,988				
Italy, 1866–1887	1065	1045							70		10,802,887	10,147,171	803,469	768,573				
" 1888–1890, 1892–1902	1060	1048	1298	1184	1066	1055	39	52		67	7,376,031	6,973,166	516,184	492,586	328,366	252,939	29,833	25,201
" 1866–1902, living births	1062	1046							68		18,719,925	17,631,428	1,360,464	1,300,389				
" 1892–1900	1057	1047	1295	1192	1066	1054	39	53		66	4,736,647	4,479,329	326,952	312,339	213,135	164,536	19,398	16,272
Greece, 1870–1885	1140	969							11		380,516	333,866	4,018	4,147				
Switzerland, 1871–1903	1049	1024	1341	1190	1059	1034	37	62		48	1,380,886	1,316,440	66,689	65,107	59,981	44,727	4,714	3,960
" 1891–1900	1045	1051	1336	1170	1054	1058	35	58		46	429,072	410,685	20,531	19,532	17,225	12,891	1,330	1,137
Austria, Nov. 1, 1829, to Oct. 31, 1850	1060	1047	1432	1195	1064	1051	12	24		127	6,010,960	5,668,394	862,563	823,450	81,826	57,129	22,766	19,057
" Nov. 1, 1850, to 1900	1062	1055	1350	1177	1067	1060	23	37		143	18,062,821	17,016,265	2,969,294	2,813,562	465,622	344,969	120,923	102,779
" Nov. 1, 1829, to 1901	1061	1054	1360	1181	1066	1058	20	34		139	24,501,718	23,090,067	3,897,607	3,699,418	560,084	411,842	146,534	124,095
" 1891–1900	1059	1062	1342	1231	1066	1068	27	40		145	4,099,818	3,870,556	687,130	647,109	124,869	93,039	30,499	24,779
Hungary, 1865–1875	1058	1039							71		2,952,292	2,791,429	222,449	214,098				
" 1876–1903	1054	1043	1313	1177	1059	1047	18	30		84	9,571,066	9,076,819	858,628	822,882	192,091	146,329	28,044	23,825
" 1865–1903, living births	1055	1043							80		12,523,358	11,868,248	1,081,077	1,360,980				
" 1891–1900	1055	1048	1323	1212	1060	1053	21	32		88	3,473,963	3,292,811	329,384	314,208	82,072	62,027	11,517	9,503

TABLE VIII—*Continued*

STATISTICS, BY SEX, OF LEGITIMATE AND ILLEGITIMATE LIVING- AND STILL-BIRTHS

Place and Period.	No. of Sons for 1000 Daughters.						No. of Legitimate Still-births in 1000 Total Legitimate Births.	No. of Illegitimate Still-births in 1000 Total Illegitimate Births.	No. of Illegitimate Living Births in 1000 Living Births.	No. of Illegitimate Total Births in 1000 Total Births.	Children Born Alive.				Children Stillborn.			
	Born Alive.		Stillborn.		Total Born.						Legitimate.		Illegitimate.		Legitimate.		Illegitimate.	
	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.					Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
EUROPE.																		
Prussia, 1816–1871	1051	1035	1348	1169	1060	1041	37	54		75	16,041,184	15,267,305	1,269,680	1,227,284	686,980	509,770	77,419	66,213
Bavaria, Oct. 1, 1835, to 1871	1060	1034	1423	1167	1069	1038	31	34		209	2,353,882	2,221,094	612,637	592,380	85,844	60,322	22,863	19,682
Saxony, 1836–1871	1054	1043	1364	1243	1065	1053	44	56		147	1,266,202	1,201,790	215,198	206,366	64,010	46,933	13,836	11,130
German Empire, 1872–1902	1054	1048	1291	1224	1061	1056	35	46		90	26,025,787	24,698,968	2,553,697	2,435,824	1,030,553	797,999	131,284	107,264
" " 1891–1900	1053	1052	1288	1239	1060	1060	31	42		91	8,869,536	8,418,662	879,234	835,516	316,347	245,709	42,077	33,973
Belgium, 1841–1865	1055	1028	1376	1170	1067	1036	43	60		77	1,628,109	1,543,533	131,688	128,128	82,102	59,687	9,019	7,708
" 1866–1880	1050	1024							72		1,194,476	1,137,736	91,027	88,915				
" 1881–1903	1048	1025	1346	1120	1059	1031	44	60		84	1,977,963	1,887,750	175,292	170 971	101,315	75,277	11,745	10,491
" 1841–1903, living births	1051	1026							77		4,800,548	4,569,019	398,007	388,014				
" 1891–1900	1048	1027	1351	1129	1060	1033	43	61		85	874,531	834,186	79,411	77,315	44,486	32,921	5,438	4,816
Luxemburg, 1891–1900	1049	1014							33		31,815	30,339	1,064	1,049				
Holland, 1861–1903	1054	1041	1284	1153	1064	1050	47	81		33	3,079,672	2,921,230	99,993	96,072	167,020	130,049	9,309	8,071
" 1891–1900	1052	1054	1282	1201	1061	1065	43	81		30	788,200	749,432	23,589	22,390	39,260	30,616	2,207	1,837
Denmark, 1851–1903	1051	1051	1315	242	1058	1058	31	42		103	1,468 375	1,397,280	167,513	159,387	51,907	39,478	7,947	6,399
" 1891–1900	1052	1063	1263	1224	1057	1068	24	34		96	322,133	306,072	33,960	31,942	8,446	6,685	1,277	1,043
Norway, 1841–1870	1054	1048							84		667 166	633,057	60,648	57,867				
" 1871–1902	1059	1064	1297	1257	1065	1072	28	45		80	912,860	862,010	77,934	73,264	29,098	22,427	3,960	3,150
" 1841–1902, living births	1057	1057							81		1,580,026	1,495,067	138,582	131,131				
" 1891–1900	1063	1063	1305	1223	1068	1069	25	41		74	301,525	283,743	23,648	22,243	8,397	6,433	1,069	874
Sweden, 1751–1800	1047	1013							34		1,712,499	1,635,586	59,308	58,544				
" 1801–1860	1047	1035							75		2,693,393	2,571,744	216,259	208,887				
" 1861–1900	1053	1051	1345	1257	1061	1059	28	40		104	2,446,888	2,322,840	279,591	265,981	78,361	58,247	12,506	9,946
" 1751–1900, living births	1049	1041							75		6,852,780	6,530,170	555,158	533,412				
" 1891–1900	1058	1052	1311	1249	1064	1058	25	34		110	613,403	579,816	74,591	70,916	17,159	13,085	2,860	2,289
Finland, 1751–1800	1032	1010							28		616,857	597,427	17,364	17,190				
" 1801–1877	1042	1033							68		1,867,636	1,793,046	136,321	131,913				
" 1878–1902	1054	1047	1290	1209	1060	1054	26	45		68	952,047	903,155	68,248	65,203	27,750	21,506	3,470	2,870
" 1751–1902, living births	1043	1036							61		3,436,540	3,293,628	221,933	214,306				
" 1891–1900	1056	1039	1271	1187	1060	1045	25	44		67	392,221	371,596	27,288	26,264	11,143	8,770	1,345	1,133
Russia, European, 1861–1865, 1867–1899	1052	1048							28		71,636,061	68,072,610	2,044,811	1,951,482				
" " 1891–1899	1055	1045							27		20,148 535	19,106,277	560,978	536,854				
Bulgaria, 1891–1900	1082	1054	1359	1195	1083	1061	5	49		3	707,297	653,812	1,906	1,808	3,846	2,830	104	87

TABLE VIII—*Concluded*

STATISTICS, BY SEX, OF LEGITIMATE AND ILLEGITIMATE LIVING- AND STILL-BIRTHS

Place and Period.	No. of Sons for 1000 Daughters.						No. of Legitimate Still-births in 1000 Total Legitimate Births.	No. of Illegitimate Still-births in 1000 Total Illegitimate Births.	No. of Illegitimate Living Births in 1000 Living Births.	No. of Illegitimate Total Births in 1000 Total Births.	Children Born Alive.				Children Stillborn.			
	Born Alive.		Stillborn.		Total Born.						Legitimate.		Illegitimate.		Legitimate.		Illegitimate.	
	Legitimate.	Illegitimate	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.					Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
EUROPE.																		
Servia, 1861–1887	1059	1108									875,776	826,957	5,566	5,022				
" 1888–1903	1056	1046	1327	1441	1059	1051	13	17		11	785,234	743,429	8,577	8,201	11,326	8,536	170	118
" 1861–1903, living births	1058	1070							8		1,661,010	1,570,386	14,143	13,223				
" 1891–1900	1057	1062	1346	1439	1060	1066	10	13		11	492,886	466,330	5,519	5,196	5,661	4,206	82	57
Roumania, 1864–1871	1034	1053							30		581,131	512,532	17,595	16,704				
" 1872–1897	1087	1017	1374	1234	1091	1023	12	31		58	2,492,076	2,291,605	145,933	143,462	33,550	24,417	5,171	4,191
" 1864–1897, living births	1096	1021							52		3,073,207	2,804,137	163,528	160,166				
" 1891–1897	1071	1004	1415	1095	1074	1007	11	30		73	772,399	721,137	57,429	57,181	10,142	7,170	1,840	1,680
Europe, total of foregoing: living births	1055	1045							68		281,123,540	266,552,424	20,421,914	19,550,629				
Europe, total of foregoing: living- and still-births	1056	1045	1362	1201	1064	1052	32	47	92	93	135,036,863	127,899,555	13,547,226	12,965,339	4,966,086	3,646,106	720,128	599,591
Europe, for the most part, 1891–1900: living births	1053	1047							63		57,354,617	54,451,344	3,866,154	3,692,384				
Europe, for the most part, 1891–1900: living- and still births	1055	1049	1312	1209	1062	1056	31	46	88	89	30,847,620	29,245,217	2,950,714	2,812,785	1,109,521	838,800	152,671	126,260
Aggregate for white race, Europe, United States, S. America, Australasia: living births	1055	1044							68		283,141,650	268,471,113	20,558,333	19,682,679				
Aggregate for white race, Europe, United States, S. America, Australasia: living- and still-births	1056	1045	1362	1201	1064	1052	32	47	92	93	135,160,379	128,018,118	13,567,364	12,985,248	4,972,206	3,650,716	721,588	600,703
Aggregate for all races, white and Japanese: living births	1055	1044							68		290,452,516	275,436,186	21,110,402	20,223,091				
Aggregate for all races, white and Japanese: living- and still-births	1056	1045	1352	1192	1064	1052	32	50	92	93	137,177,055	129,931,065	13,761,540	13,170,555	5,150,166	3,810,347	768,144	644,426

NOTES.—(A) Connecticut, 1887–1899; total illegitimate births (living- + still-births), male 1,228, female 1,152.

(B) District of Columbia, 1879–1902.	White.	Colored.
Children born alive, legitimate	55,533	32,090
" " " illegitimate	1,772	10,090
Children stillborn, legitimate	3,536	3,972
" " illegitimate	478	2,800

On examining the figures for *living births* in this table it immediately and strikingly appears that *in the great majority of cases (though with notable exceptions) the proportion of males to females born alive is materially lower in the illegitimate than in the corresponding legitimate class;* and in many instances the difference is very marked.

The aggregate figures for Europe show a ratio of sons to 1000 daughters born alive of 1055 legitimate for 1045 illegitimate. In many particular instances the difference is much greater than this; as in Rhode Island (1047–988), Portugal (1071–1005) Greece (1140–969), Roumania (1096–1021). In some instances there is little difference between the two classes, as in New Zealand, the German Empire for 1891–1900, Denmark for 1851–1903, Norway for 1841–1902, Sweden for 1861–1900. In only a few instances are the proportions of sons to daughters greater in the illegitimate than in the legitimate class; namely, in England and Wales, Scotland, Spain (for 1900–1903), Switzerland (1891–1900), Austria (1891–1900), Holland (1891–1900), Denmark (1891–1900), Norway (1871–1902), Servia, Uruguay. In some of these cases the statistics of illegitimate births are not sufficiently numerous for very reliable final conclusions. In some cases the illegitimate son-rate is the higher at one period and the lower at another; and in many of the countries there is observable a tendency to a comparative increase in the illegitimate son-rate during the course and toward the latter portion of the last century. It is notable that the northern countries of Europe are especially included among those exhibiting an equal or higher proportion of sons born alive illegitimate as compared with the legitimate; and among these exceptions England and Scotland are notable for the constancy and degree of their departure from the general rule.

Turning now to the statistics of illegitimate *stillbirths*, it appears that almost without exception *the proportion of males to females stillborn is decidedly lower in the illegitimate than in the corresponding legitimate class.* The aggregate figures for Europe give son-ratios of 1362 and 1201 for the legitimates

and illegitimates respectively. The only exceptions to this general rule are Servia and the District of Columbia (whites); and in these cases the numbers of births from which the ratios are calculated are too small for reliance.

It is, then, apparent that in illegitimate births the proportions of sons to daughters born, both living- and still-born, are in general materially less than in the case of legitimate births. How is this to be accounted for?

One other fact stands out distinctly that may have a bearing on this point, namely, that *the proportion of stillbirths is always greater among illegitimates than among legitimates.* This appears in every case, without exception, in the statistics presented in Table VIII; and the excess of illegitimate stillbirths is probably greater than the statistics indicate, owing to the motives and facility for concealment of such cases.

This result is to be expected, from the conditions surrounding illegitimacy, the desire to avoid exposure, and the lax standards generally current as to the morality of feticide. A higher mortality of illegitimate infants prevails not only before birth but also after birth, from poor hygienic surroundings, intentional or enforced neglect, or more sinister causes. Thus, the comparative death rates per 10,000 of legitimate and illegitimate infants under one year old for the following localities were:

TABLE IX

COMPARATIVE DEATH RATES, PER 10,000 BORN LIVING, OF LEGITIMATE AND ILLEGIMATE INFANTS UNDER ONE YEAR OF AGE

		Legitimate.	Illegitimate.
France	1898–1902	1,442	2,547
Austria	1893–1901	2,186	2,934
German Empire (for the most part)	1872–1880	2,572	3,665
German Empire	1901–1902	1,838	3,163
Sweden	1831–1835	955	1,653

The fact that there is a greater proportion of stillbirths among illegitimate births would seem to bring this class under the operation of the principle, brought out above, that the greater the proportion of abortions and stillbirths the less will be the

ratio of males to females born alive. It would therefore seem rational to suppose that the disparity in the ratios of sons to daughters living born in the legitimate and illegitimate condition is due to the greater proportion of stillbirths among the illegitimates; that is, that the initial and primary proportions of the sexes (or in the totality of births) is the same in the two classes, but that discrepancy arises in the unequal distribution of living- and still-births in the two.

The statistics presented in Table VIII do not, however, *prima facie* bear out this explanation to any great degree. In one instance only, Connecticut, among illegitimate living births there is a ratio of males to females of 983, while the total illegitimate births yield a ratio of 1066, which approximates the ratio of legitimate living births, 1067. In general, however, and in the general average, the discrepancy between the legitimate and illegitimate ratios is as great in the reported total births as in the living births, the two running about parallel. This is due to the fact that while among the illegitimates there are more stillbirths to lower the living-birth ratio, the proportion of sons to daughters stillborn is also lowered; these two opposite factors balance each other, so that in the total births (living- plus still-births) the disparity remains about equal to that in the living births. Thus, in the statistics for Europe for 1891–1900 the son-ratios in legitimate and illegitimate living births were 1055 and 1049, a difference of 6; but although the proportions of stillbirths were 31 and 46 per mille respectively, yet since the son-ratio for legitimate stillbirths (1312) was much greater than than for the illegitimate (1209), the son-ratios for the total births, 1062 and 1056, show a parallel increase and the same difference of 6 as in the living births. The statistics *prima facie* therefore would indicate that the same excess of births of sons in the legitimate as compared with the illegitimate class is found in the total births as in the living births.

No adequate explanation of the less son-rate in illegitimate births has yet been offered. So improbable has such a difference seemed to some writers, on *a priori* grounds, that they have been loath to acknowledge the credibility of the dis-

crepancy. The influence of the unequal proportions of stillbirths causing (after starting with equal ratios) a disparity in the ratios of the living births seems a rational and probable explanation for most or all of the disparity, in spite of the failure of the statistics to corroborate it. The incompleteness of the available statistics of abortions and stillbirths, especially for the first half of gestation, must be borne in mind. The full effect of the antenatal mortality on the sex ratios of illegitimates, and whether there is any real initial or primary inequality in the legitimate and illegitimate ratios, can be determined definitely only by full and ample statistics.

Explanation is not forthcoming to account for the higher son-ratios in the illegitimate class in the few countries (England, Scotland, etc.) that are exceptional to the general rule.

Since among illegitimates there is always a higher proportion of stillbirths and usually a lower proportion of living male births, it is obvious that in different communities the general proportion of stillbirths and the sex ratios of living births for the entire population will be more or less affected in correspondence with the degree of illegitimacy or moral environment existing in the different places.

Foundlings, or abandoned infants, are often included in vital statistics with the illegitimates. That this classification is correct is corroborated by the low ratio of males to females in this class. Thus, in Italy (1872–1880), there were 14,702 male and 14,715 female living foundlings, a proportion of 999 males for every 1000 females.

Arithmetical Fluctuations in Sex Ratios According to Numbers of Births

It is manifest that sex ratios calculated on the basis of large numbers of births will be more constant and reliable than those calculated from a small number of births. The question arises as to the arithmetical relation between the number of births and to the reliability of the sex ratios derived therefrom ; that is, as to what extent ratios in given cases represent the real sex-determining factors involved and to what degree the element of mere

factitious arithmetical fluctuation may enter; or what number of births is requisite to afford sex ratios that really adequately represent the sex-determining factors and can be relied on for purposes of comparison and generalization in this respect.

To throw light on this question Table X is presented, showing for each year of the decade 1891–1900 the annual ratios of males to females born alive in a number of countries and states of varying size. We cannot conceive of sex-determining conditions on a large scale being more nearly identical and uniform than (under ordinary circumstances) in the same country or locality in successive years; consequently the variations in the sex ratios in a short series of consecutive years would apparently be largely attributable to the purely factitious disturbances introduced by the arithmetical element.

For example, as shown in Table X, the annual sex ratios in the German Empire, based on statistics of nearly 2,000,000 births per year, range during the decade between the narrow limits of 1051 and 1057, a maximum variation of 6; while the maximum difference between the ratios for any two consecutive years is 3 (1057 — 1054 — 1051). In the District of Columbia, however, averaging only the small number of 2757 births per year, the ratios fluctuate widely, ranging through the decade between 993 and 1127, a fluctuation of 134; while consecutive years show a difference as high as 100 (1027 — 1127).

The data in Table X can be analyzed in several ways. We can consider for each country (A) the maximum difference between the ratios during the decade — the difference between the maximum and minimum ratios (such as, in the case of Massachusetts, 1069–1046, or 23); (B) the maximum difference between consecutive years (as, in the same state, 1062–1047, or 15); (C) the average of the differences between the ratios for consecutive years (as, for Massachusetts, the sum of $9 + 14 + 8 + 2 + 7 + 3 + 15 + 10 + 4$ divided by 9, or 8). The best basis for comparison and judgment however is probably afforded by the average ratio for the decade, being founded on ten times the number of births as the individual years; from this we can consider (D) the average deviation of the annual

Table X

Annual Proportions of the Sexes at Birth (Living), in Certain Countries, for 1891–1900

Year.	District of Columbia (White).		Rhode Island.		Connecticut.		New South Wales.		Baden.		Massachusetts.		Ireland.	
	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).	No. of Sons for 1,000 Daughters.	Number of Births (Living).
1891	993	2,513	1,087	9,154	1,060	17,801	1,069	39,458	1,048	55,305	1,069	62,966	1,054	108,116
1892	1,085	2,648	1,045	8,899	1,047	18,873	1,052	40,041	1,056	54,858	1,060	65,724	1,057	104,234
1893	1,122	2,585	1,020	9,646	1,057	19,321	1,067	40,342	1,048	55,621	1,046	67,157	1,050	106,082
1894	1,035	3,007	1,052	9,593	1,097	19,345	1,055	38,951	1,038	54,291	1,054	66,913	1,048	105,354
1895	1,027	2,878	1,082	9,882	1,062	18,970	1,052	38,774	1,048	56,652	1,052	67,528	1,062	106,113
1896	1,127	2,786	1,033	10,750	1,078	20,376	1,049	36,506	1,048	57,863	1,059	72,300	1,058	107,641
1897	1,078	2,761	1,036	10,795	1,062	19,591	1,040	37,247	1,049	58,918	1,062	73,178	1,052	106,664
1898	1,094	2,737	1,030	10,730	1,071	20,063	1,070	36,222	1,055	60,483	1,047	73,083	1,060	105,457
1899	1,126	2,866	1,067	10,831	1,063	19,894	1,043	36,461	1,064	62,288	1,057	70,457	1,055	103,900
1900	1,114	2,790	1,030	11,084	1,032	20,524	1,043	37,146	1,057	63,482	1,061	73,386	1,061	101,459
1891–1900	1,080	27,571	1,047	101,364	1,063	194,758	1,054	381,148	1,051	579,761	1,057	692,692	1,056	1,055,020
	Bavaria.		France.		England and Wales.		Austria.		Italy.		Japan.		German Empire.	
1891	1,059	205,437	1,048	866,377	1,038	914,157	1,062	920,306	1,057	1,132,139	1,043	1,086,775	1,055	1,840,172
1892	1,062	203,422	1,047	855,847	1,035	897,957	1,063	872,098	1,057	1,110,573	1,047	1,207,034	1,057	1,795,969
1893	1,063	210,009	1,045	874,672	1,038	914,542	1,065	924,298	1,058	1,126,296	1,046	1,178,428	1,054	1,865,713
1894	1,051	206,375	1,043	855,388	1,036	890,289	1,058	902,159	1,056	1,102,935	1,056	1,208,983	1,051	1,841,205
1895	1,049	208,855	1,033	834,173	1,034	922,291	1,058	941,184	1,058	1,092,102	1,052	1,246,427	1,052	1,877,278
1896	1,057	215,652	1,042	865,586	1,036	915,309	1,059	948,419	1,057	1,095,505	1,033	1,282,178	1,052	1,914,749
1897	1,058	216,207	1,041	859,107	1,037	921,693	1,057	944,764	1,059	1,101,848	1,052	1,334,125	1,053	1,926,689
1898	1,051	219,279	1,046	843,933	1,032	923,265	1,057	923,241	1,057	1,070,074	1,034	1,369,638	1,052	1,964,731
1899	1,052	224,164	1,041	847,627	1,039	928,646	1,057	960,205	1,053	1,088,558	1,059	1,388,185	1,053	1,980,304
1900	1,061	226,213	1,041	827,297	1,033	927,062	1,061	967,939	1,055	1,067,376	1,050	1,406,624	1,055	1,996,138
1891–1900	1,056	2,135,613	1,043	8,530,007	1,036	9,155,211	1,060	9,304,613	1,057	10,987,406	1,047	12,708,397	1,053	19,002,948

ratios from the decennial ratio (as, for Massachusetts, the sum of 12 + 3 + 11 + 3 + 5 + 2 + 5 + 10 + 0 + 4 divided by 10, or 5.5); and (E) the maximum difference between the annual ratios and the decennial ratio (as 12). In Table XI is presented a summary of the data from Table X analyzed along these lines.

It is obvious that the smaller the differences between the ratios of the various years are, the more closely does the sex ratio represent the actual sex-determining factors operative, with the purely arithmetical disturbing element reduced to a minimum; and the size of the differences affords a measure of the reliability of the sex ratios. It distinctly appears from Table XI (as is to

TABLE XI

SUMMARY OF NUMERICAL FLUCTUATIONS IN ANNUAL RATIOS OF SEXES AT BIRTH (LIVING), IN CERTAIN COUNTRIES, FOR 1891–1900 (FROM TABLE X).

Place.	Average Annual Number of Births (Living).	Variations in Sex Ratios.				
		Average Deviation of Annual Ratios from the Ratio for the Decade. (D)	Maximum Annual Deviation from Ratio for Decade. (E)	Average Difference Between Consecutive Years. (C)	Maximum Difference Between Consecutive Years. (A)	Maximum Difference During Decade. (B)
District of Columbia (white)...	2,757	37.5	87	48.1	100	134
Rhode Island.....	10,136	19.8	40	29	49	67
Connecticut.....	19,476	11.5	34	19.8	40	65
New South Wales.....	38,115	9	16	12.9	30	30
Baden	57,976	5.5	13	6.6	10	26
Massachusetts.....	69,269	5.5	12	8	15	23
Ireland	105,502	3.9	8	6.1	14	14
Bavaria	213,561	4.5	7	4.9	12	14
France.....	853,001	3.1	10	3.9	10	15
England and Wales.....	915,521	1.8	4	3.4	7	7
Austria	930,461	2.5	5	1.4	4	8
Italy	1,098,741	1.1	4	1.8	4	6
Japan.....	1,270,840	6.6	14	12.1	25	29
German Empire.....	1,900,295	1.4	4	1.6	3	6

be expected from *a priori* grounds) that as the number of births from which the ratios are calculated increases, the differences between the annual ratios in general decrease; and the validity

of the ratios increases correspondingly. This inverse variation of the differences of the ratios and the numbers of births seems to show clearly that the annual fluctuations are due mainly to the factitious arithmetical element.

Thus, in the District of Columbia, with an annual average of 2757 white living births, the annual ratios show an average variation from the decennial ratio of ± 37.5 per thousand, or 3.75 percent, with a maximum deviation of 87 per mille; from which we might say that the 2757 births yield a sex ratio correct on the average within ± 3.75 percent, but with a possible variation of ± 8.7 percent. A basis of about 10,000 births, in the case of Rhode Island, yields ratios correct on the average within ± 1.98 percent, but with a possible variation of up to 4 percent. A basis of about 100,000 births (Ireland) yields ratios reliable within an average of .39 percent, with a possible maximum deviation of .8 percent; while a million or two of births (Italy and Germany) afford ratios constant within an average of .11 to .14 percent, with a possible maximum deviation of .4 percent.

This analysis affords a means of estimating the degree of weight and value that can be placed on ratios calculated on varying numbers of births. Ratios determined from only a few thousand births are of very little value for purposes of generalization or comparison; to obtain ratios of an average correctness or constancy of within .5 percent would require a basis of about 50,000 to 70,000 births. In interpreting and comparing sex ratios, and in estimating the validity of the conclusions of investigators as to the factors that seem to govern the determination of sex, the extent of the statistics and the possible purely arithmetical variations must always be taken into consideration.

Sex ratios derived from births to the number of a million or more would seem to represent a high degree of validity, beyond the operation of chance, and yet even with these high numbers we do not find absolute constancy from year to year, and sometimes the differences are considerable (as in the case of France, with 853,000 births, a difference of 1 percent between consecutive years). There are, therefore, actual though usually slight annual fluctuations in the relative numbers of the sexes born

even in the largest countries; the causes of these fluctuations remain to be explained.

Japan in this analysis (as in others) is a marked exception to the general rule, inasmuch as with more than a million and a quarter of births it shows remarkably great fluctuations and differences in the annual sex ratios, as great as might be expected from a twenty-fifth the number of births. As to the significance of this fact I have no suggestions to offer.

The foregoing analysis is along objective and *a posteriori* lines only; an analysis of the mathematical principles involved and an application of the theory of probabilities and variation is left to experts in this line.

Variations with Time (Decades) in Sex Ratios

In comparing sex ratios for single years for a short period, as in Table X, the numbers are too small and the periods too short to reveal any definite change with the passage of time; the annual ratios fluctuate both sides of the general average. On comparing the ratios for, say, ten-year periods over a long period of time it will be found that in some countries the proportion of male to female births shows a continuous and definite decrease, in others an increase, while in still other countries the ratios have remained about constant. Table XII shows, by decades, the sex ratios of living and stillbirths for certain countries through the period of registration, together with the reported proportions of stillbirths, for the purpose of bringing out the changes that have taken place in these ratios with the passage of time.

From this table it appears that there has been throughout the registration period a steady decrease in the proportion of males to females born alive in England and Wales, France, Italy, Switzerland, Belgium, and Roumania; in Denmark, Norway, Sweden, Finland, and Russia there has been an increase; while Austria, Hungary, and Germany have remained about stationary in this respect. There has been a decrease in the proportions of males to females stillborn in France, Italy, Germany, Belgium, and Denmark; in Austria there was a decrease in this ratio for

Table XII

Number of Males for 1000 Females Born in Living Births and Stillbirths, and Number of Stillbirths per Thousand of Total Births, for Certain Countries, by Decades

Decade.	England and Wales.	Scotland.	Ireland.	France.			Italy.			Switzerland.			Austria.			Hungary.	Prussia.			Bavaria.			Saxony.		
	Living Birth Ratio.	Living Birth Ratio.	Living Birth Ratio.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths Per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.
1811–1820				1067																					
1821–1830				1062																					
1831–1840				1063													1051	1346	33						
1841–1850	1049			1056	1441	34							1056	1385	13		1050	1352	37						
1851–1860	1046			1053	1482	41							1061	1366	14		1048	1343	39	1055	1369	31	1054	1348	46
1861–1870	1042	1054		1050	1452	44							1060	1317	20		1048	1324	41	1053	1361	31	1051	1360	44
1871–1880	1038	1056	1056	1048	1450	44	1064	1337	30	1053	1337	43	1063	1291	21		1051	1299	41	1054	1351	33	1052	1306	44
1881–1890	1037	1054	1058	1047	1427	46	1059	1308	34	1048	1323	38	1062	1307	24	1054	1054	1291	41	1054	1322	33	1054	1309	41
1891–1900	1036	1050	1056	1043	1369	46	1057	1288	40	1045	1323	36	1059	1308	28	1052	1054	1278	38	1052	1273	33	1046	1312	37
													1060	1319	29	1054	1053	1285	33	1056	1273	31	1052	1309	34

TABLE XII—*Continued*

NUMBER OF MALES FOR 1000 FEMALES BORN IN LIVING BIRTHS AND STILLBIRTHS, AND NUMBER OF STILLBIRTHS PER THOUSAND OF TOTAL BIRTHS, FOR CERTAIN COUNTRIES, BY DECADES

Decade.	German Empire.			Belgium.			Holland			Denmark.			Norway.			Sweden.			Finland.	Russia.	Servia.	Roumania.		
	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.	Living Birth Ratio.	Living Birth Ratio	Living Birth Ratio.	Living Birth Ratio.	Stillbirth Ratio.	Stillbirths per Mille.
1751–1760																1044	1358	26	1029					
1761–1770																1046	1367	26	1035					
1771–1780																1043	1376	27	1029					
1781–1790																1045	1411	27	1032					
1791–1800																1049	1405	28	1037					
1801–1810																1046		25	1037					
1811–1820																1046		25	1034					
1821–1830																1045		26	1039					
1831–1840																1047		30	1036					
1841–1850				1053	1356	42	1056	1270	48				1051	1295	40	1045		31	1038					
1851–1860				1052	1342	45	1054	1286	52	1047	1345	44	1052	1323	41	1049		32	1046					
1861–1870				1052	1353	46	1055	1272	51	1050	1321	38	1056	1284	38	1051	1353	33	1048	1046	1062			
1871–1880	1054	1289	40	1047	1344	43	1052	1278	52	1051	1303	33	1053	1302	36	1053	1318	31	1050	1051	1062	1106	1326	18
1881–1890	1051	1280	37	1045	1325	46	1055	1283	49	1052	1292	28	1061	1272	29	1053	1355	27	1051	1055	1053	1083	1368	11
1891–1900	1053	1282	32	1047	1323	45	1052	1278	45	1053	1258	25	1063	1295	26	1057	1302	26	1054	1054	1057	1064	1422	13

four decades, followed by an increase. An increasing proportion of *reported* stillbirths is shown in France, Italy, and Austria; a decrease in Switzerland, Germany, Denmark, Norway, and Roumania; and stationary proportions in Bavaria, Belgium, Holland, and Sweden.

Explanation of the causes for these temporal changes in sex ratios at birth is not forthcoming, unless they are associated with corresponding changes in the proportion of stillbirths to total births. A progressive increase in the proportion of stillbirths should, *ceteris paribus*, be associated with a decrease in the proportions of males to females both living- and still-born; and *vice versa*. For France, Italy, and Holland this agreement between the proportions of stillbirths and the sex ratios of living- and still-births exists; but for the other countries the agreement is only partial or absent. In some instances, therefore, though not in all, some association between stillbirths and changes in sex ratios is possibly shown; but the imperfections and deficiencies of the statistics of stillbirths must be borne in mind.

Influence of Sanitary Environment (as Measured by the General Death Rate or Otherwise) on Ratios of the Sexes at Birth

The hypothesis might be presented that antenatal mortality may be governed partly by the surrounding hygienic conditions; and hence, that in different communities or classes the proportions of stillbirths may to a certain degree correspond to the general death rates, and through the effect of intrauterine mortality on the proportions of the sexes in living births the latter may be modified and vary in correspondence with the general mortality. This relation would be such that, other things being equal, a low general death rate would be accompanied by a high ratio of males to females born alive, and *vice versa*.

For instance, the colored race in the District of Columbia has a low proportion of males born alive (1031 as compared with 1062 for the white race), associated with a high proportion of stillbirths (138 as compared with 65) and a high general death

rate (32.3 as compared with 18.3); and it might be supposed that the insanitary environment causing the high death rate also to some extent causes the high stillbirth rate, which in turn causes the smaller proportion of males born alive.

In Table II are given the death rates corresponding to the various birth statistics. No general correspondence between death rates and sex ratios, of the character just mentioned, is shown by these figures. Some localities (as Spain) have a high son-rate with a high death rate; others (as France) with a lower death rate have a low son-rate. If there is any relation between death rates and stillbirth percentages, many other factors come in to disturb and obscure the correspondence; and the statistics given in Table II do not on their face revealany connection between the two, although a closer analysis and study might show some influence of sanitary conditions on sex determination or sex proportions at birth.

Influence of Birth Rates

The statistics of birth rates given in Table II do not show any constant obvious correspondence between the general birth rates and the proportions of the sexes at birth in different countries. Estimates of birth rates in many instances, however, are unreliable.

Any possible variations in the sex ratios according to the *month of birth* (or of conception) is a subject open to investigation.

In Tables I, II, and VIII, are given available statistics of the sex ratios at birth in different *races*, *countries*, and (according to the country) *climates*. Quite marked differences in the sex ratios are shown in different places, of which such explanations and discussion as are offerable have been already presented. In one marked instance (that of the colored race) the marked discrepancy in sex ratios of living births is obviously due mainly to the high intrauterine mortality; and the question of the initial proportions of the sexes at conception, or the essential and primary ratios of sex determination, for different places can not be settled until complete statistics of abortions and stillbirths are obtained.

Numerous studies have been made as to the relation of such conditions as the *ages, vigor, etc., of the parents*, the *duration of the marriages*, the *social and financial condition, occupation, religion, etc., of the parents*, etc., to the ratios of the sexes at birth and the influence of these conditions on the determination of sex. In a number of countries and municipalities the birth statistics are classified according to these rubrics, thus affording data for further studies. While some interesting points have been developed by these investigations, yet the conclusions have been derived mainly from the statistics of living births only, the modifying effect of stillbirths in varying proportions not being appreciated. It is obvious that the variations in sex ratios observed may have been due partly at least to the influence of the conditions studied on the antenatal mortality; and an accurate estimate of their effect on the real primary determination of sex (at conception) cannot be made without the collection of complete statistics of stillbirths and abortions and their inclusion in the consideration of the problem. A reinvestigation and revision of these studies on the basis of the totality of births and with a sufficient volume of statistics to afford reliable ratios is needed.

The Comparative Ratios of the Sexes at Birth in City and Country

Comparative ratios of the sexes at birth in city and country districts is another subject that has been studied, but different investigations have yielded contradictory results, as in some cases the ratio of males to females is higher, and in other cases lower, in the country than in cities. Thus, the reported births in the "registration area" of the United States for the census year 1900 yield a ratio of males to 1000 females of 1046 in the cities and 1041 in the rural districts. The statistics for France for 1898–1902 (see Table II) give a similar showing, 1044 for the urban and 1040 for the rural districts for living births (1056 and 1052 for total births). The statistics for Paris as compared with the remainder of France for 1886–1902, however, give an opposite showing, 1037 for Paris and 1043 for the remainder of the country (living births). In this latter

instance, after reckoning in the stillbirths the ratio for total births is the same (1056) in both Paris and the rest of the country, so that the discrepancy is explainable entirely by the difference in antenatal mortality, and any idea that there is any real difference in sex-determining influence is negatived. In cities generally the proportion of stillbirths reported is greater than in the country, due to a greater degree of illegitimacy, less favorable hygienic conditions and greater death rate, or other causes; this factor alone could introduce differences in the sex ratios of living births in urban and rural districts, leading us in general, however, to expect a lower proportion of sons in the cities. It is again obvious, therefore, that in the attempt to determine what difference there may be in the action of urban and rural conditions on sex-determination the effect of abortions and stillbirths must be thoroughly explored and excluded.

Effect of War on Sex Ratios at Birth

It is a popular notion that more sons than usual are born in time of war. This idea doubtless originates from the subconscious supposition that a guiding providence would in this way make good the loss of men in war, and is not at all grounded on that extensive statistical basis which alone can justify the opinion. It is a long way from martial operations to the biologic processes that determine sex, and although the supposition scarcely deserves serious consideration, the comparative statistics of births during periods of war and peace in France are given in Table XIII.

Table XIII

Statistics of Births in France During Periods of War and Peace

Year.	Births (Living).		Number of Sons for 1000 Daughters.	Number of Stillbirths.	Number of Deaths.	
	Male.	Female.				
1806–1810	2,379,971	2,239,355	1063		3,837,711	War.
1811–1815	2,403,625	2,250,027	1068		3,946,661	War.
1816–1820	2,463,896	2,311,638	1066		3,785,175	Peace.
1869	485,883	462,643	1050	45,280	864,320	Peace.
1870	482,775	460,740	1048	45,169	1,046,909	War and commune.
1871	422,879	403,242	1049	40,315	1,271,010	War and commune.
1872	494,481	471,519	1049	43,967	793,064	Peace.

These statistics show no more than the ordinary range of differences between periods of peace and war, and lend no support to the popular notion under consideration.

Ratios of Sexes Among Firstborn Children, as Compared with the Later Born

Some observations show the same ratio of sexes among the children firstborn as among those later born; other observations show a different ratio. The matter is one to be settled by means of a large volume of statistics.

Ratios of the Sexes at Birth According to the Size of the Families

Several observers (Janse, Geissler, von Körösy) have shown that in large families there is a greater proportion of sons than in small families. Thus, in 3000 families of six or more children each, aggregating 24,876 children, I found a ratio of 1083 sons for 1000 daughters; but the ratio in smaller families for the same places and periods was not determined for comparison. Geissler's large body of statistics of births in Saxony for 1876–1885 yielded the following results:

839,719 families of 2 to 7 children each:
Sons, 1,675,666.
Daughters, 1,583,786.
Number of sons for 1000 daughters, 1058.
159,042 families of more than 7 children each:
Sons, 792,639.
Daughters, 742,213.
Number of sons for 1000 daughters, 1068.

Possibly the higher proportion of sons in large families may be due, partly at least, to a smaller number of abortions and stillbirths in these families, leaving a larger number of children to be born alive, and also causing a corresponding increase in the proportion of sons living born. To settle this point definitely, however, would require full statistics of the stillbirths in these cases.

Sex Ratio in Multiple Births

In Tables XIV, XV, and XVI are given some statistics by sex of twin, triple, and quadruple births. While these data are

TABLE XIV

STATISTICS OF TWIN BIRTHS

Place and Period.	Total Number of Twin Births.	Number of Cases of			Total Number of Children.
		2 Boys.	1 Boy and 1 Girl.	2 Girls.	
England and Wales, 1845, 1846, 1852	16,125	5,169	5,938	5,018	32,250
France, 1872–1880	86,643	28,800	30,627	27,216	173,286
" 1898–1902	47,245	15,781	16,513	14,951	94,490
Italy, 1872–1880	111,105	37,098	39,771	34,236	222,210
Austria, 1871–1880	98,400	32,100	36,880	29,420	196,800
" 1896–1901	71,595	23,406	26,419	21,770	143,190
Hungary, 1876–1880	48,155	14,970	18,960	14,225	96,310
Saxony, 1832–1841	8,247	2,952	2,598	2,697	16,494
German Empire, 1872–1880	152,626	49,007	57,365	46,254	305,252
" " 1901–1902	52,105	16,872	19,577	15,656	104,210
Belgium, 1890, 1895, 1900	6,071	1,992	2,140	1,939	12,142
Sweden, 1871–1880	19,590	6,350	7,310	5,930	39,180
Total	717,907	234,497	264,098	219,312	1,435,814

Total number of boys, 733,092.

Total number of girls, 702,722.

Number of sons for 1,000 daughters, 1,043.

TABLE XV

STATISTICS OF TRIPLE BIRTHS

Place and Period.	Total Number of Triple Births.	Number of Cases of				Total Number of Children.
		3 Boys.	2 Boys and 1 Girl.	1 Boy and 2 Girls.	3 Girls.	
Michigan, 1893–1894, 1898–1900.	25	4	7	8	6	75
England and Wales, 1845, 1846, 1852	86	30	19	18	19	258
Italy, 1872–1880	1,403	333	429	284	357	4,209
Austria, 1871–1880	1,291	336	320	329	306	3,873
Austria, 1896–1901	771	194	175	215	187	2,313
Hungary, 1876–1880	592	125	180	168	119	1,776
German Empire, 1872–1880	1,688	412	443	431	402	5,064
German Empire, 1901–1902	518	106	118	155	139	1,554
Belgium, 1841–1885, 1890, 1895, 1900	842	207	222	207	206	2,526
Sweden, 1871–1880	205	39	57	55	54	615
Total	7,421	1,786	1,970	1,870	1,795	22,263

Total number of boys, 11,168.

Total number of girls, 11,095.

Number of sons for 1,000 daughters, 1,007.

but scattering, and not exhaustive of all recorded multiple births, they are perhaps sufficiently numerous to be somewhat representative.

TABLE XVI

STATISTICS OF QUADRUPLE BIRTHS

North Dakota, 1905	1 case.
Massachusetts, 1891, 1901, 1903	3 cases.
England and Wales, 1845–1846	3 cases.
France, 1899–1900	2 cases.
Belgium, 1841–1870	8 cases.
Germany, 1901–1902	4 cases.
Austria, 1893–1900	15 cases.
Total	36 cases.
Four boys	5 cases.
Three boys and one girl	2 cases.
Two boys and two girls	7 cases.
One boy and three girls	11 cases.
Four girls	11 cases.
Total	36 cases.
Total number of boys	51
Total number of girls	93
Total number of children	144
Number of sons for 1,000 daughters	548

The comparative sex ratios for single births (aggregate average for living births shown in Table I) and for these multiple births are, then, as follows:

	Number of Sons for 1000 Daughters.
Single births	1057
Twin births	1043
Triple births	1007
Quadruple births	548

These figures show a *progressive decrease in the proportion of sons as the number at a birth increases*, and apparently indicate that multiple gestation has influence on the determination of sex. The only discernible relation between multiple gestation and a relative numerical increase in the female sex is the matter

of size. Infants born at multiple births are in general smaller than infants born singly; and newborn female fetuses are generally supposed to be smaller in size than males. Crowding in the uterus results in small fetuses; and if there is anything in the smallness of fetuses that tends toward their determination to the female sex, this might explain why females are relatively more numerous in multiple births. The more the crowding the smaller are the fetuses and the more numerous are the females. But if there is anything in this explanation, the effect of crowding must operate before the very early period when sex is distinctly and visibly differentiated; and if the opinion now largely prevalent is correct that sex is determined in the ovum at conception, or even before in the female ovule, it is difficult to see how any subsequent condition like intrauterine crowding could have any influence in the matter. Altogether, the apparent relation of multiple gestation to the sex ratios opens some question as to the period when sex determination takes place.

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ETHNOGRAPHIC AND LINGUISTIC NOTES ON THE PAEZ INDIANS OF TIERRA ADENTRO, CAUCA, COLOMBIA

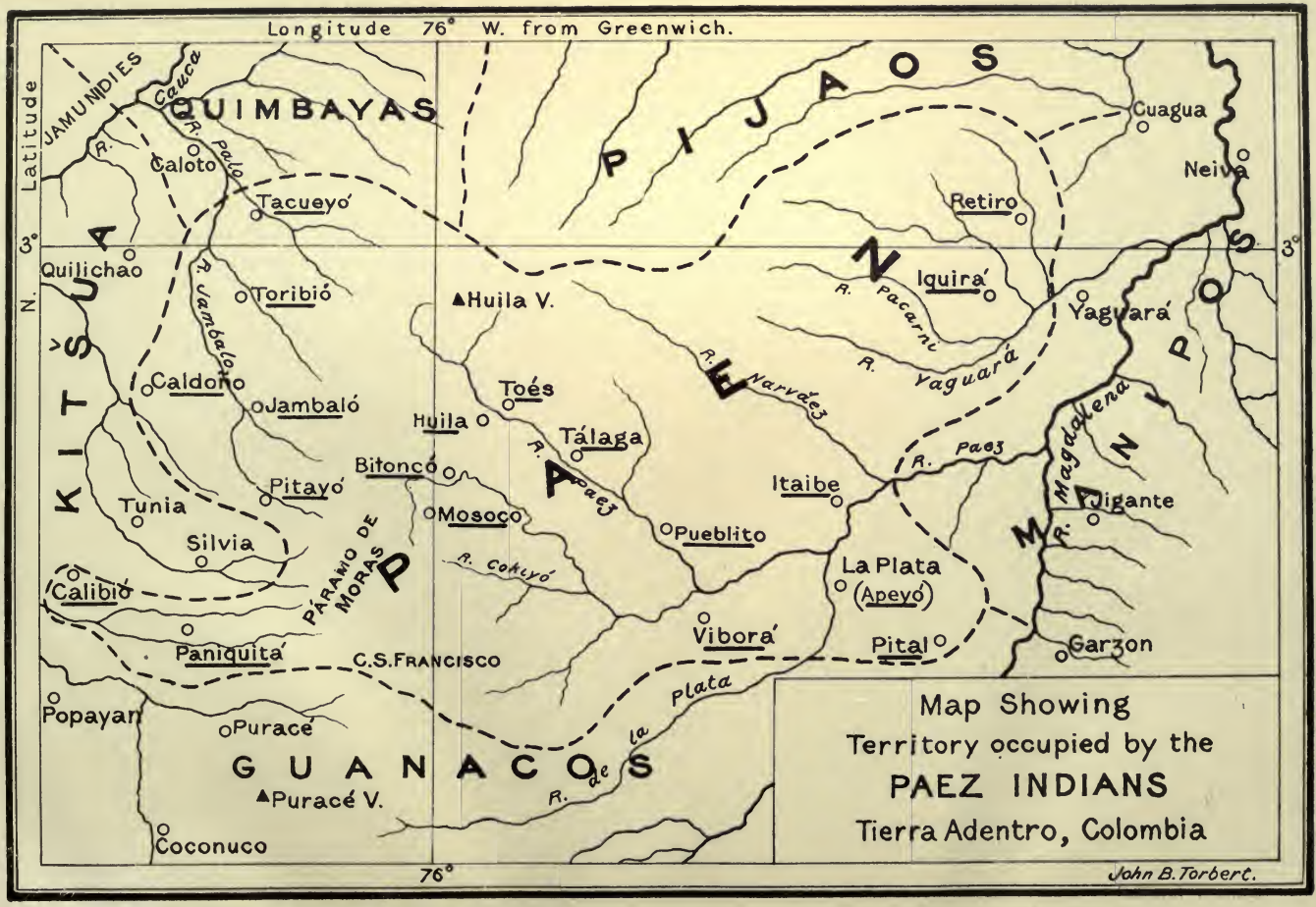
BY

HENRY PITTIER DE FÁBREGA

CONTENTS

PAGE

Introduction 305
Ethnographic Notes 306
Former Occupants. "Planos de Indios." Huacas 306
Former and Present Distribution 310
Physical Characteristics 313
Reproduction and Death 314
Diseases 315
Clothing. Personal Adornment 316
Dwellings 318
Construction of Bridges 320
Food. Cultivated and Other Useful Plants 321
Religion, Customs, Superstitions 324
Grammatical Notes 327
I — Phonetics 328
II — Word-formation 330
Remarks 330
Compound Nouns 330
Formation of Adjectives 332
Formation of Verbs 333
(*a*) Primitive Verbs 334
(*b*) Denominative Verbs 334
(*c*) Verbal Prefixes 335
III — Parts of Speech 335
A — The Noun 335
(1) Gender of Nouns 335
(2) Number of Nouns 336
(3) Double Gender 336
B — The Adjective 337
C — Pronouns 337
D — The Verb 338
E — Borrowed Words 339
(1) From the Spanish 339
(2) From the Kitšua 340
(3) From Other Languages 341
F — The Numerals 341
IV — Vocabulary 342



Map Showing
Territory occupied by the
PAEZ INDIANS
Tierra Adentro, Colombia

John B. Torbert.

ETHNOGRAPHIC AND LINGUISTIC NOTES ON THE PAEZ INDIANS OF TIERRA ADENTRO, CAUCA, COLOMBIA

By H. PITTIER DE FÁBREGA

Introduction

Very little is known of the ethnology of the aboriginal inhabitants of the western and central cordilleras of Colombia and the intervening broad valley of Cauca. The early historians and chroniclers have left only long lists of more or less confused tribal names, along with the recital of the protracted war of extermination conducted with conscienceless and selfish cruelty by the conquistadores. With few exceptions modern writers have found little or no opportunity to deal with what is left of these interesting people.

With special reference to the Paez Indians, who are the subject of these notes, our notions have hitherto been derived almost exclusively from the materials collected by Castillo y Orozco about 1735, and published in 1877 with brief analytical notes by the late Colombian scholar, Señor Don Ezequiel Uricoechea.[1]

Early in 1906 the writer visited the section of the central cordillera inhabited by the Paez, staying a few days at two of their principal villages, namely, at Tacueyó, at the headwaters of the Palo river on the western side of the mountains, and at Huila, at the junction of the Paez and San Vicente rivers, on the Indian reservation known as Tierra Adentro. The personnel of the expedition, in addition to the author, with a few friends and two servants, consisted of native Indians, so that good opportunities were afforded for becoming familiar with the Paez language and to gain an insight into native manners and customs.

[1] Eujenio del Castillo i Orozco, *Vocabulario Páez-Castellano, Catecismo, Nociones gramaticales i dos Pláticas,* (publicado) *con Adiciones, Correcciones i un Vocabulario Castellano-Páez,* por Ezequiel Uricoechea. Paris: 1877.

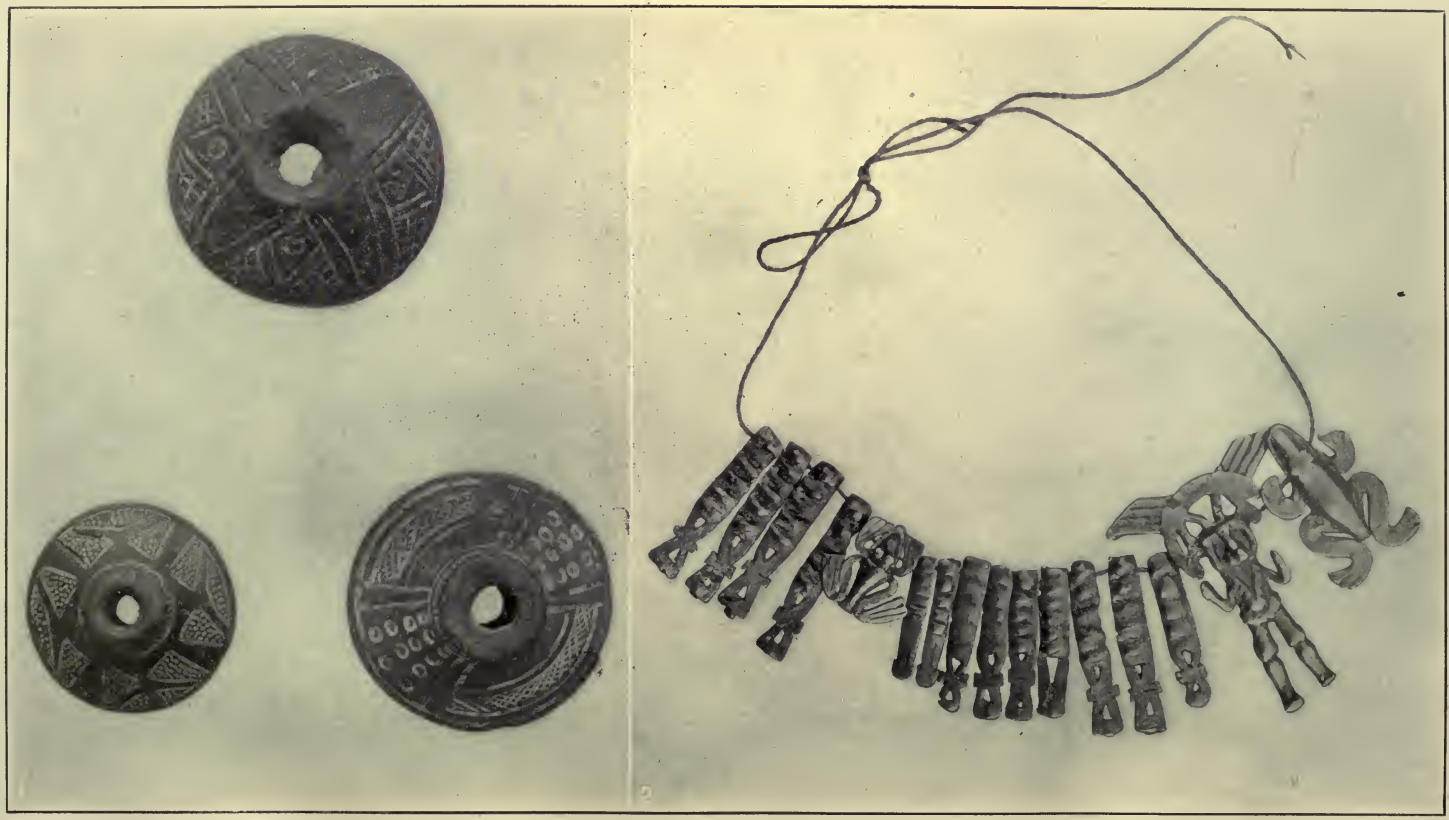
The present object is not in any way to contribute an exhaustive monograph on the Paez, but simply to give a summary of our former knowledge of them, together with the chief results of the personal information collected during the visit referred to.

ETHNOGRAPHIC NOTES

FORMER OCCUPANTS. "PLANOS DE INDIOS." HUACAS

In addition to the still existing tribes, traces of the former occupancy of the Cauca valley and the adjacent mountains by a dense Indian population are found at every step. The names of extinct groups, like the Hilamas, Ocaches, Jamundíes, and others, impressed on the minds of the former Spanish inhabitants by reason of some of their more gruesome customs, have come down to the present generation, although the tribes, as such, have disappeared. Of the Hilamas and Ocaches it is said they were cannibals. At present their more or less mixed descendants still live in the villages of Las Pavas and Vijes, near Cali; the "Paveños" have become inveterate legal fighters, keeping their judges and alcaldes constantly occupied; while the "Vijeños," on the other hand, are now so peaceful that the court-house is known to have been closed for eighteen months at a time.

Of the Jamundíes I was told that they were indefatigable warriors, having fought the Spanish invaders to the last of their strength. Their name is perpetuated in that of the little town of Jamundí, near which I visited the very interesting vale of Agua Sucia, which may have been one of their principal strongholds, as well as a rich gold-washing place. The hills were and still are partly covered with graves, or *huacas*, and these have been found so abundant in gold objects as to have induced enterprising miners, or *huaqueros*, to conduct a stream of water from a long distance in order to completely wash the slopes. I do not attempt to mention the fabulous riches that are said to have been extracted from this place and from several other no less rich discoveries. An immense amount of pottery, often highly ornamented, together with grinding-stones, hatchets,



SPINDLE WHORLS GOLD OBJECTS

emeralds, and other objects, were ruthlessly destroyed or scattered about, without consideration for their archeological or even for their intrinsic value. Among the pieces of pottery more commonly found are the small elegantly designed disks, or spindle-whorls, of which I procured several specimens for the United States National Museum (plate II, 1). I obtained also a minutely wrought spider, and one of the gold fish-hooks that are often met with on sand beaches along the streams.

The principal Jamundí relic of Agua Sucia, and which is not likely to be displaced for some time, is the so-called "Piedra de los Sacrificios," an immense block of old eruptive stone, covered with pictographs (plate III, 1). The miners and peasants living in the district believe that a definite meaning is attached to these rude drawings, and possibly some speculative archeologist will see in them more or less mystic symbolism that my lesser imagination fails to discover; for I think we must be contented with regarding them simply as the product of representative art in its infancy. A few of the glyphs are reproduced here, some giving an idea of the geometric notions of the draftsmen, while the others are rudiments of the art of designing (plate II, 1, and figures 1, 2).

On the way to Tacueyó I became acquainted for the first time with a so-called "plano de Indio," such as are found at short intervals on the mountain ridges of the entire Cauca region. While pursuing our way on the top of a very narrow spur, we suddenly found that the crest was cut across by a very deep ditch that showed every evidence of having been the work of man. Beyond this ditch the top of the hill had very probably been artificially leveled off so as to form a plane surface of about 15 meters in width and 20 meters in length. At the end of this esplanade the hill is cut by another ditch, identical with the first. The distance between the two ditches is very much greater than the length of the esplanade, amounting to more than 100 meters.

According to all indications, the level space was the site of an Indian house, and that part of the hill between the ditches is generally found to be full of graves, those on the house site

containing, as a rule, gold objects and pieces of superior pottery. We observed many of these "planos de Indios" on the road between Corinto and Tacueyó, their situation corresponding ex-

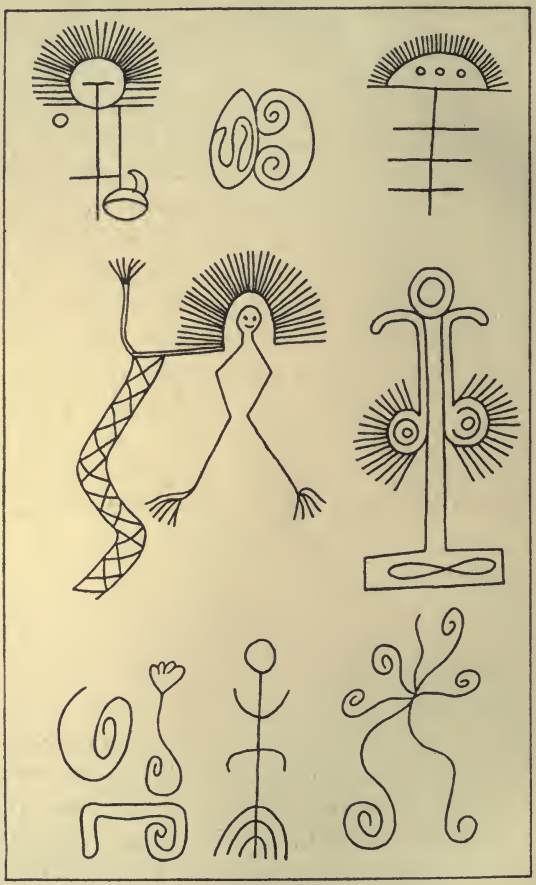


FIG. 1. — Pictographs on the "Piedra de los Sacrificios."

actly with what we know of the present habits of isolation of the Paez Indians. The number of graves at each site does not however seem to agree with the former custom of these Indians of abandoning a house as soon as a birth or a death had taken place in it.

As a very good example of the altitude at which the former

1. PIEDRA DE LOS SACRIFICIOS (TAMUNDÍ)
2. CUT HILL NEAR TACUEYÓ

inhabitants of these valleys established their residences, I may mention that the highest "plano" on the cordillera was found at about 3,300 meters at El Alto de las Cruces, one of the spurs of the Páramo de Buena Vista, the limit of the forest being here

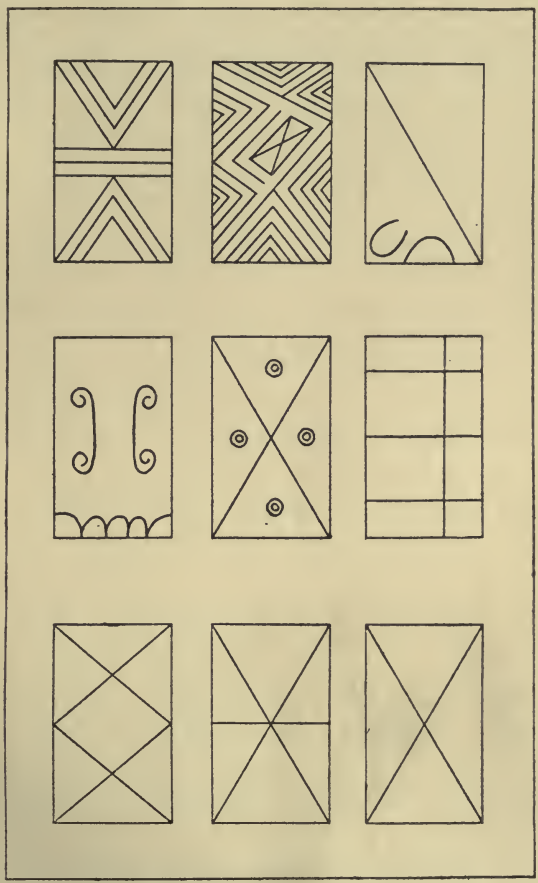


FIG. 2. — Geometrical figures on the "Piedra de los Sacrificios."

at about 3,600 meters. The greatest altitude of the abodes of the present Indians scarcely exceeds 2,600 meters.

While on this subject I shall mention an explanation of the "planos" as it was given by one of our Indians. "In old days,"

he said, "the caciques or chieftains, had their messages transmitted from valley to valley by means of runners who were stationed at short intervals along the main roads. Each runner kept himself in readiness to start on the arrival of a message, thus insuring rapid transmission." As the "planos" and also the old trails are found on almost every ridge, it is difficult enough to judge of the value of this explanation; but, if I am not mistaken, such a system of communication existed without doubt at a short distance southward among the Incas of Ecuador and Peru, and perhaps extended into the Cauca valley.

On our return from Huila, while traveling between Toribió and Tacueyó, I noticed on the left an isolated hill with a part of its ridge separated from the rest by a deep cross-cut, evidently artificial. The top of the separated part looked in the distance as if also isolated by a ditch. My friend, Mr Emile Bizot, a mining engineer of wide experience in these parts, informs me that this is a common feature of the hilly district formerly inhabited by the natives, and that the enclosed surface always contains numerous graves (plate III, 2).

The high peaks of the most rugged districts of Tierra Adentro are often crowned by isolated *huacas*, which are especially sought by treasure-hunters. At Tacueyó we had the opportunity of admiring a set of gold objects found in such graves and of which we made the photograph reproduced in plate II, 2. The frogs are of a type quite distinct from those with which I became familiar in Costa Rica. The representative of a human being recalls certain Chibchan idols, or, according to Mr W. E. Safford, Kitšua amulets. As to the thirteen remaining pieces of gold, quite thin and almost uniform in shape, they are perfectly new to me.

Former and Present Distribution

According to Father Rodriguez[1] the Paez, or Paós, Indians lived on the summit and slopes of the *Cordillera de Guanacas*, "sierra muy fria que llaman el Páramo de las Papas," a defini-

[1] P. Manuel Rodriguez, *El Marañon y Amazonas. Historia de los descubrimientos, entradas y reducciones de Naciones*, Madrid, 1684.

tion which would correspond pretty well with the explanation given by subsequent authors, except for its last, untranslated member, which seems to imply a lack of geographical knowledge on the part of Father Rodriguez. According to modern maps, indeed, the term "Alto", or "Cordillera", de Guanacas, seems to apply only to the group or node of mountains north of the Coconucos and Puracé volcanoes, and south of the towering Huila. This includes the "Páramo de Moras," which we crossed on our return from Tierra Adentro, but not the *Páramo de las Papas*, which is situated south of the Puracé, at the headwaters of the Cauca, Caquetá, and Magdalena rivers.

If we admit, then, that in Father Rodriguez's description the name Páramo de las Papas is merely a lapsus for Páramo de Moras, the area given by him corresponds pretty well with that which is recognized as such by Uricoechea in his introduction to Castillo's work, excepting that the latter extends this area northward to include the upper Yaguará basin. According to Castillo, this last was probably inhabited by another *parcialidad*, which he calls Bemb, "indios infieles de nacion pijaos." At Huila, when pointing northward to the valleys on the eastern slope of the volcano and asking who lived there, the Indians answered, "Los Pijaos", and among the Spanish people it is generally understood that the Paez and the Pijaos are one and the same. This is also the opinion of Reclus,[1] who says: "Among the various tribes that wandered through the thick forests of this [eastern] slope of the [central] Cordillera, the most barbarous were the *Pijaos* or *Paez*, who selected innocent victims to offer to their divinities. The enemy killed in a fight could be only indifferent to the gods; but a woman, a child, an inoffensive stranger, the pure ones, were welcome to the bloodthirsty genii." And these monstrous sacrifices must be repeated at short intervals to insure the permanent good-will of the gods.

The area given on the accompanying map (plate 1) corresponds with the above-mentioned description by Rodriguez,

[1] Reclus, *Géographie universelle*, XVIII, p. 305.

only it might be necessary to modify it slightly if we were able to localize all of the thirty-four villages or hamlets reputed to be of Paez stock and included in the following systematic list:

1. *Paez Basin*

As-at	Inzá	Suín
Chinas	Láme	Tálaga
Chitoco	Mosoco	Toés
Cuetandó	Nátaga	Vitoncó
El Pital	San Andrés de la Plata	Yaquirá
El Naranjal	San José	

2. *Palo Basin*

Jambaló	San Francisco	Toribió
Pitaió	Tacueyó	

3. *Ovejas, Corre, and Piendama Mountains*

Cajibio	Caldonió	Paniquitá

4. *Yaguará Basin*

El Retiro		Iquirá

5. *Locality Uncertain*

Abirama	Osyó	Ricaurte
Caldera	Pueblo Nuevo	Tobóima
La Troja	Pusó	

The principal neighbors of the Paez Indians, according to the above description of their territory, were to the north — the Quimbayas on the western slope of the central cordillera, and the Pijaos on the eastern slope. To their east were the Manipos, in the Magdalena valley; the Guanacos were on both watersheds of the central cordillera southward; and westward on the plains of the Cauca valley, the Kitšua and the Jamundíes. The Kitšua were probably the most advanced in culture of all these different stocks, and the ones whose influence is more easily recognized in the customs and idiom of the Paez. Their language is also the only one which has come down to us in its integrity.

There is no positive proof of the identity of the Paez and Pijaos, and it is fair to state that there are many data pointing to the fact that originally they were merely neighbors, and allied against the Spaniards, as, for instance, in 1641, when they de-

stroyed the city of Caloto, then on the Magdalena river, according to Alcedo. But it is not unlikely that, later on, during their decline, the Pijaos, Paós, and perhaps several other tribes became mixed, and those whom we now call *Paez* are the survivors in blood, customs, and traditions, of all these frequently named *parcialidades* or *naciones*.

Physical Characteristics

There is no special reference by former writers respecting the physical characteristics of these Indians, probably because of the apparent uniformity in type of all the tribes of tropical South America. According to my own very fleeting observations the Paez are small, broad-shouldered, with small bony hands, and feet broadened toward the extremities. Their skin is very dark, a character common to all Indians living at great altitudes. In the case of almost every adult, both male and female, coming under my observation, I observed a fine black pubescence covering all visible parts of the body. They appear to be generally strong and healthy, and their physical endurance is not below the average. On our trip across the cordillera each adult man carried at least thirty kilograms, and many of them more than fifty, and none complained of being too heavily laden, although the trail up to nearly 4,000 meters and down again was exceedingly rough and steep, requiring at times not only much exertion but equal presence of mind.

It is well to mention, after Uricoechea, that the Paeces are naturally inclined to warfare, and invariably join one side or the other in the unceasing Colombian revolutions. In early times they raided the Spanish establishments, the destruction of Caloto on two occasions (the first time in 1641) being still held by them in vivid remembrance as glorious feats of their ancestors. I was even assured that not long ago, during the last war, they were with difficulty prevented from making an incursion on the neighboring Cauca cattle ranches.

I was quite surprised to find among the Paez Indians a character that I had noticed previously in Central America, but of which no record could be found in current literature. I refer to

the odor peculiar to the Indians, which becomes quite noticeable when they are sweating and which so closely resembles that of the secretion of the so-called *sahino*, or wild hog (*Dicotyles tajacu* L.), that I have more than once been deceived into believing that our trail crossed the path of a drove of these animals.

When at rest the Paez men almost invariably sit on their heels, the toes sustaining the whole weight of the body, while the women sit with their legs stretched together on the ground, even when near the fire in their houses. In micturition young girls remain standing. The gait of both men and women is short-paced and easy, the body being always slightly inclined forward, probably on account of the habit of carrying heavy loads.

Like all children of Nature, the Paez Indians are very keen observers of their surroundings, as is shown by the minuteness of their differentiation in plants and in certain groups of insects. Castillo, for instance, gives the names of no fewer than six different varieties of ants —

kan-kák	*eiχ-kák-ue*	*ošа-i*
kák-fints	*gnue-ñandi*	*to-fitš*

and I collected very few plants for which they did not have a ready name.

Reproduction and Death

When a girl reached puberty the event was celebrated among the old Paez Indians by a special dance called *itsa-ko*, during which the young naked female was placed in a hole dug outside the ball-house and thoroughly washed with *chicha*. We have no notice of pre-marital liberty being conceded to women, nor of the relation of children to parents in the family organization. As tradition has it, the pre-conquest Paez were polygamous, and notwithstanding the efforts of the missionaries, it is almost certain that this practice has not completely disappeared. We know nothing about the existence of marriage ceremonies before the introduction of the Catholic ritual. It is likely, however, that marriages were endogamous and free, and, as such, a very frail institution, as Castillo informs us that even in his time

marriage bonds were not definitely made until experiment indicated the fecundity of the woman, and that the union was dissolved at the will of the husband if the wife proved to be barren. The same authority informs us that the wife had to give her husband the necessary clothing, while the husband provided food for the family.

A custom mentioned by Castillo was that during menses the women spent the time sitting in small huts expressly built for that purpose, for fear of contaminating the common dwelling and of bringing disease and death to its occupants.

Rodriguez relates another custom in connection with childbirth and death: "... y siempre que pare la mujer, ó que muere alguno de su familia, desamparan la casa, dexando en ella al difunto con cantidad de bastimento y de la chicha, brebage, que beben: y á las casas donde parió la mujer, las dejan con las inmundicias de el parto, y acabadas de nacer las criatures, las laban, y se vañan sus madres, poniendose en viaje á buscar nuevo paraje para su habitacion, que siempre procuran sea en parte muy fragosa, por no ser visitados."

These details are confirmed by Castillo and were probably still observed in his time. As to what is done at present, and regarding the family organization in general, it is very difficult to obtain reliable information. The Indians are very jealous of their women, do not tolerate in them any intercourse with strangers, and become instantly distrustful when questioned about family matters.

With reference to death, Castillo differs from Rodriguez in that he states that a dying person was taken from the house, so that he did not actually die in it, and that the dwelling was destroyed by fire. He does not mention the custom of leaving food near the corpse, but states that the body was buried and a fence built around the grave.

Diseases

No diseases came under my observation during my stay at Huila and Tacueyó, and the Indians rather impressed me as being a healthy people. But if their vocabulary affords suffi-

cient testimony, they have their share of physical ailments. Besides itch (*lel*), tumors of several kinds (*lol-sek*, tonsilitis; *koú*, tumor in the groin), they have original names for smallpox (*buzgué*), which I was told often rages among them, for diarrhœa (*u-tšitš*), dysentery (*mengué*), and intermittent or malarial fevers (*ya-ya-gué* in the ancient dialect, *kué-kué-ué* in that spoken at the present day).

Of the practices and superstitions made use of in the cure of these diseases I could gain no information, but it is very probable that the Paez still have their own medicine-men.

Clothing. Personal Adornment

At present the wool obtained from the numerous sheep kept by the Paez Indians plays the most important part in the clothing of both sexes. I cannot find any direct information on the fabrics used before the introduction of sheep by the Spaniards, but it is most likely that the Paez obtained cotton from the Indians of the Cauca and Magdalena plains, the cultivation and the manufacture of which into thread must have formed one of the principal industries in the latter. I have already referred to the great number of clay spindle-whorls found in the graves and on old dwelling sites throughout the Cauca valley. Judging by these we may feel sure that the former inhabitants were great spinners. On the other hand, the present Paez Indians still weave most of their own clothing, and there is no reason why they should not have done so formerly.

The dress of the men consists of a pair of short trousers (*hiú*), that are evidently a concession to modern civilization. These are made of raw cotton cloth, or of imported fabrics, and reach from the waist to about the knees. Over the shoulders is worn a broad rectangular piece of white woolen homespun cloth, split in the middle in the form of a poncho so as to allow the head to pass through, and hanging free front and back. This is called *tund-atš*, i. e., 'the cloth that binds, or covers.' It is generally worn next to the skin, but sometimes a light cotton shirt, called *atš-petš*, is first put on. Over the *tund-atš* they carry on their left side, hanging by straps that pass over the right shoulder, the coca

TRAVELING PAEZ WOMAN AND CHILDREN

PAEZ GRINDING STONE

bag and the small receptacle that contains the quicklime used with the former. When out of doors a second piece of woolen cloth, longer and narrower than the first and called simply *atš*, is thrown over the shoulders, with the head likewise thrust through the middle. A narrow-brimmed hat (*tsua*) the like of which is found among the Kitšua, is the usual complement of this dress. It is made of the outer skin of a tall grass (*Gynerium saccharoides*), resembling sugar-cane and common along rivers.

The women all dress in the same way, with fabrics invariably woven by themselves. The underwear, which is often dispensed with, consists of a narrow piece of woolen tissue used as a loin cloth, passing between the legs and then rolled around the hips. Over this article is worn a broad piece of dark woolen cloth, wrapped along the body and limbs in the form of a skirt. This is the *anaco*, or *pamb-atš*, and it is attached to the waist by means of a sash called *vília*, the elaborateness and ornamentation of which vary with the wealth of the owner. The upper part of the body is covered with a ruana called *atš-tul*, sewed along the right side and on the right shoulder, but open at the left side, being simply pinned on the left shoulder with a wooden peg or a fish-bone. When traveling the women provide themselves with another broad piece of cloth (*spatš*) which is used either as a cover or for wrapping the baby on the back. In the latter case the cloth is secured by means of a belt (plate IV, 1).

Women also wear necklaces, made now of common glass beads, silver coins, or small sea-shells, the number of strings depending on the wealth of the husband. The mention in Castillo's vocabulary of a word for bracelet (*kaseñand-gnue-tsa*) indicates the former use of such ornament. Females have no headgear. Married women part their hair along the median line of the head and allow it to hang back in two braids. Little girls wear their hair loosely behind the shoulders. In former times women painted their faces blue with the juice of a fruit called *kii*. Speaking of this custom, which seems to be obsolete now, Castillo facetiously says: "fruta . . . con cuyo zumo se pintan el rostro las Indias (*i aun las que no lo son*)." Men formerly decorated their bodies and faces with *tok*, the red color

extracted from the seeds of *Bixa orellana*, which they applied by means of a cylinder of clay (*kaanda*) on which certain designs were carved. Specimens of such cylinders are often found in graves.

Children are very scantily clothed. The boys go about naked until they reach their twelfth year, and the little girls wear only a short *atš-tul*. The clothing of the male and female adults seems to be worn as long as it lasts. As is the case with all Indians living at high altitudes, the Paez are not especially fond of bathing, and cleanliness is not a cardinal virtue with them. In retiring for the night, they simply wrap their garments tighter around them, the children using old rags in lieu of blankets.

The ornamentation of the *vilia*, or sash, with several brilliant colors and the desire of giving a uniform hue to the darker clothing of the women, gave origin to the art of dyeing, which very likely is to-day in its decline. The dyes were derived chiefly from plants. Black was obtained from *šal*, an arborescent *Phyllanthus* that has a semi-domesticated appearance and forms characteristic thickets around inhabited places, like Vitoncó; the same color is also contained in the young pods of the *huarango* (*Cæsalpinia tinctoria*), a spiny tree often seen near the houses and extensively used at the present time for dyeing wool. The roots of *tuk-uétse*, a Rubiacea (*Relbunium hypocarpium* Hemsl.) akin to the madder, produce a scarlet color. Different kinds of blue dyes were extracted from the fruit of the jagua (*kii*, probably *Genipa* sp.) and from an *Indigofera*. Many other tinctorial plants very likely escaped my observation and are gradually passing out of use on account of the introduction of foreign fabrics.

Dwellings

The Paeces have permanent houses in their thirty-four villages and temporary abodes on their corn plantations. These latter are merely small huts, the walls of which are more or less elaborate according to the altitude, being made tighter near the upper limit of culture. They represent the primitive type of

THE VILLAGE OF HUILA

The Houses are in the Patches of High Vegetation Scattered in the Savanna. In the Distance is the Huila Volcano, but the Extreme Summit is not Visible

habitation, the agglomerations being the result of the efforts of the missionaries.

The villages are generally in the open grazing districts at the bottom of the valleys, on side plateaus, or on broad ridges. They are not compact in the common sense of the word, but consist of isolated groups of houses, the approximate common center of which is often indicated by the whitewashed thatch-roofed church (plate v).

The walls of the permanent houses are made of a kind of *bajareque*, i. e., a skeleton of canes filled in with clay. In the better homes the interior is divided into two or more rooms, usually very small, with a hearth in the middle; but oftener there are no interior partitions, the dwelling consisting of a single square apartment. In every case that came under my observation the interior was very untidy.

The Indians openly objected to our entering their houses, hence I could gain only casual glimpses of their domiciles, the furnishing of which seems to be an imitation of that of the dwellings of the few Spanish people living among them or in the immediate neighborhood.

Outside the houses they generally have a cane-crusher of primitive type, with horizontal smooth cylinders moved by means of levers at each end. A loom and a grinding stone are also seen occasionally under an adjacent shelter (plates IV, 2, and VI).

There may often be seen, either about or inside the housse, very large jars used as receptacles in the elaboration of the chicha. These utensils seem to be almost the only survival of the ancient earthenware industry. The smaller pottery vessels which were seen occasionally had been taken from old graves.

Each group of houses, in which several generations of a single family dwell, is surrounded by a small enclosed field, planted with sugar-cane, plantains, oranges and other fruits, and greens and roots of daily use. The garden enclosure is formed by a ditch, inside of which is a wooden fence or a stone wall, the latter often crowned by a hedge of maguey (*Furcræa*), lechero (*Euphorbia*), borrachero (*Solanum*), and other bushes.

In this way an efficient protection is afforded against depredations by cattle or sheep.

Construction of Bridges

The Paez Indians are very clever bridge builders and are often called considerable distances to employ their skill in this direction. I observed three different types of native bridges, two of which were entirely new to me. The more primitive one consists simply of a vine stretched across a river, and crossed by hanging and progressing with the hands and arms. The second type is a frail-looking bamboo structure, the base of which is an arch free in the air, or suspended somewhat like our suspension bridges (plates VII, 2).

The third type of bridge is a much more substantial structure, built of heavy timbers apparently with an understanding of the laws of gravity. On each side of the river a pair of strong beams are built into pillars of stonework, so that the weight upon the immured extremities counterbalances the free ends independently of the supports by which the latter are upheld. Thus solidly fixed, the two pairs are opposite each other with a more or less wide space between their extremities. To span this, the ends of both pairs are first connected by means of transverse ties, inserted between beams and props, the whole being solidly lashed together with vines. On these ties two more beams of sufficient length are laid, which serve to complete the span. The main structure of the bridge being thus formed, a heavy floor, generally of round stems, is laid over it, and the whole is protected by a roof of elaborate construction (plates VII, 1, and VIII). It is useless to say that not a single nail is used to unite the numerous parts of the structure, a vine called *ptakuia* being exclusively used for this purpose.

We saw two of these large structures, one on the Paez river near Huila, the other on the Moras river, on the trail from Vitoncó to Mosoco. But we were informed that most of the larger rivers in Tolima and elsewhere in the Magdalena valley are bridged in the same way, and that Paez Indians are in frequent requisition elsewhere as bridge-builders.

PAEZ LOOM AND CANE CRUSHER

Food. Cultivated and Other Useful Plants

The principal food of the Paez Indians is maize, or Indian corn, of which they grow several varieties, belonging to three distinct types, namely, a sweet corn (*tšulpi*), a soft corn (*kapio*), and the common flint corn. The words *tšulpi* and *kapio* belong to the Kitšua language, a fact that points to the southern origin of these varieties. Judging from tradition, as well as from the varietal names used elsewhere in the Cauca valley, the flint corn that is grown all over the country may possibly be of northern origin. The Paez language has only one word to designate all varieties of corn, and it is interesting to note that the one now in use (*kutš* or *kukx̀*) is quite distinct from that employed in Castillo's time (*kokavi*). It is not unlikely that the present name was introduced by some of the tribes subsequently incorporated with the Paez.

The *tšulpi*, or sweet corn, is usually eaten roasted or boiled on the cob. Of soft corn, or *kapio*, they make a kind of dough called *χñiontš*, which is the base of several culinary preparations, among them the tortilla (*kuáts*). *Kaš* is a gruel made of black corn; *mutši*, or *motši* (the Kitšua *mote*), is prepared by shelling the kernels without disintegrating them. Last, but not least, large quantities of the grain are used in the preparation of chicha (*beka*).

Beans are generally cultivated along with maize. I noticed two varieties — *us kutš*, black beans, and *us bé*, red beans. The *osgual*, cited by Castillo as special to the village of Suín, are the seeds of the *Erythrina edulis* Triana, which I collected under the name of *us ual;* they are large, and when boiled taste almost exactly like the common horse-bean (*Faba vulgaris*).

Of scarcely less value as a food-staple are the several varieties of squashes, so generally cultivated and eaten as to have caused Castillo to express the opinion that "most of the Indians would perish should these fail in the province." The larger variety, *ápe-tots* (*Cucurbita maxima?*), is less common, and may have been introduced, although it already existed in Tierra Adentro in Castillo's time; *ápe*, the zapallo or pumpkin (*Cucurbita pepo*), is perhaps indigenous to the region, since the last native name,

now widely used all over Spanish America, is of Kitšua origin (*zapayú*); *ápe-te*, the most extensively cultivated variety, is called *Mejicano* by the Spanish natives, although it seems to have been cultivated in the country from time immemorial.

Several interesting edible roots or tubers, mostly under cultivation, are relished by the Paez Indians. Thus *ãs*, or *ans* (*Arracaccia esculenta*), a celery-like umbelliferous plant with large white roots; *unt*, a peculiar yam (*Dioscorea*); *nia* the cassava root; *kâka*, the potato, of which there are certainly several species; *tsẹvi*, or *šuíl* (*Ullucus tuberosus*), a very remarkable *Chenopodiacea*, of the high Andean region; *puél*, *Tropæolum tuberosum*, another species, the cultivation of which seems to be restricted to a limited district of western South America. All these plants are more or less under cultivation, but the Indians also eat many wild roots which I had no opportunity to identify. *Kambitš* (*Cyclanthera pedata*), the singularly-shaped fruit of a Cucurbit, is used as a green vegetable along with the tender sprouts of several other plants.

Among the favorite fruits the plantain naturally ranks first, and is conspicuous around the houses even at an altitude of 1,800 meters. The generic names are *plan*, suggesting the Spanish *plántano* or *plátano*, and *tulú*, a word that forms the root of *Tuluá*, the name of a town in a territory formerly occupied by the Quimbayas. The banana or *guineo*, corrupted into *kneió*, is probably an imported variety, as are several others rarely met with.

Other fruits are the *papaya*, *paiá*, not mentioned by Castillo, and the name of which indicates a modern acquisition; *šlal*, one of the granadillas (*Passiflora edulis*); *tšahú*, the pineapple, which grows only in the lower region; *úχtse*, the aguacate (*Persea gratissima*); and also several species of *Inga*, the white pulp around the seeds of which is eaten.

There are two varieties of edible guavas, the one sweet (*Psidium guayaba*), the other sweet sour (*Ps. pomiferum*); and the berries of several *Melastomataceæ*, many of which escaped my observation, are enjoyed by both children and adults.

A plant very important in the Indian economy is the coca

1. BRIDGE OVER PAEZ RIVER NEAR HUILA
2. BAMBOO BRIDGE AT TACUEYÓ

(*eš*). It is very little cultivated in Tierra Adentro, however, and the dry leaves are imported from the lower Paez and Tolima basins. To this product the Paez is indebted for his disgusting chewing and spitting habit, the use of which is still doubtful to me. Coca leaves are said to be a powerful reconstituent, allowing the Indians to endure long marches and great privation. But the women do not use it, and however often they may participate in these hardships, it is with the same endurance. At all events the Paez men never cease chewing and spitting. Each of them carries a supply of coca leaves in his *iása*, and the quicklime or *kuetan* in a small gourd, both hanging at his left side. Now and then he ejects a mouthful of green saliva, making sure that there be a clean whitewashed wall near by, in order thus to decorate it. He then takes a new handful of leaves, sprinkles them with a little *kuetan*, and fills his mouth again, ceasing this everlasting process only long enough to eat, drink, and sleep.

Tobacco is known in Tierra Adentro under the name of *nuéi-hí*, but it is never smoked or chewed. The sugar-cane, *níusa*, is cultivated in small patches. The only textile plant observed by me is a short-leaved agave called *sasto* (Span. *maguey*). The larger part of the district inhabited by the Paez is above the region in which grows the bamboo called *guadua;* but this beautiful grass is known to them under the name of *mom*, or *mum*. They transport canes of it from a distance for use in the construction of their lighter bridges; and at Huila, about 1,800 meters above sea-level, there was a small plantation of it, showing a primitive attempt at cultivation.

Several useful plants have been mentioned in connection with dyeing (page 318). Although in the Huila mountains there is at least one species of rubber-yielding *Sapium*, the Indians do not seem to have known of the elastic properties of its gum.

A most striking feature of the upper forest zone of the Palo valley is the wax-palm, *láme* (*Ceroxylum andicola*), which is also for the Indians an important economic plant on account of the wax which they obtain by scraping the lofty trunks (plate IX). This product they use mainly for illuminating purposes. Un-

fortunately the tree is being rapidly destroyed, either in the gathering of the wax or through clearing for cultivation.

RELIGION, CUSTOMS, SUPERSTITIONS

According to Rodriguez the Paez did not know of any religion. But this is diametrically opposed to Castillo's repeated mention of pagan rites still practised among his flock. Moreover, it is not reasonable to suppose that these Indians would have lived in close contact with the Kitšua, who were veritable sun-worshippers, without being influenced by their beliefs.

Itaki, the sun, was worshipped at special shrines built on the cut-off summits (*itaki finó*) of high mountains. At certain dates, fixed by their priests (*diχi*) in accordance with their omens, they congregated at these places and for many consecutive days gave themselves up to chicha drinking and all the lubric manifestations provoked by drunkenness. On these occasions no blood relation was respected; nor was there any limit to adultery. Later, after the missionaries had undertaken their civilizing work, the Indians secretly continued these hideous practices; indeed, it is even asserted that they have not yet given them up completely, although they may not commit the excesses that were formerly attributed to them, as such would be contrary to their present ideal standards.

Dances played an important part in all the diversions of the Paez. They were of several kinds, varying with the occasion. Castillo mentions the *gueió-kó*, money-begging dance (baile de pedir dinero), or *šita-ko* (sea-shell dance, baile de caracol), in which two sea-shells (bocinas), the one giving a low tone (bajon destemplado) and the other the treble, were played alternately for whole nights, remembering, "(a los cristianos) la noche de la prision de Nuestro Señor Jesucristo, i á los indios, la chicha, baile i maldades que ejecutan." Other dances of which we generally have no description were *onza-kó*, the mouse dance; *neuí-kó*, the buzzard dance; *itsa-ko*, the puberty dance of females, to which allusion has already been made (page 314); *etš-kobi-ko*, the dance of the phantom reed; *tel-kobi-ko*, the dance of the long reed, or war-dance; *la-ko* the new-house dance; *kimb-ko*,

INTERIOR AND EXTERIOR OF BRIDGE OVER PAEZ RIVER NEAR HUILA

the drum-dance, in which the women sang to the accompaniment of a drum; *vito-ko*, or *fits-ko*, the stick-dance, etc.

In addition to the shells and reeds, the Indians also accompanied their dances with a kind of drum (*kimb*), consisting of a long wooden trough hung by its extremities; and the *tsoóts*, or rattle, a calabash containing small stones or hard canna seeds and provided with a handle.

According to Castillo the Paez had also other deities, corresponding somewhat to the lares of the ancient Latins, carved images of which were often found in the houses. The *diχi*, who were at one time priests, sorcerers, and medicine-men, lived in retirement and were considered as the keepers of the doctrines of a traditional civilizer of the nation, called *Guekiaú*. So strong was their influence in Castillo's time that he complains rather bitterly about it, and proceeds to explain how the true God, wishing to free the Paez from such a devilish guide, simply employed a subterfuge to drown him in the Paez river, together with two of his apostles!

The belief in a future existence is indicated, as Uricoechea relates, by the fact that the Indians never molested white dogs, in order that they might not be bitten by them at the doors of the house beyond the grave.

There were birds and other signs of good or of evil omen. A woman would never step over a leather rope stretched on the ground, but would lift it up and pass beneath. During the construction of bridges, two men constantly beat the waters to frighten away evil spirits. The death of a person was often attributed to witchcraft, and he whose face bore some likeness to that of the dead person was often regarded as the culprit, provided the patient in his ravings had not given the name of the supposed sorcerer. The soul of a cow whose fat had been used for illumination during religious ceremonies was believed to go directly to heaven: this last belief, however, must be of post-conquest origin.

Among themselves the Indians are jovial and contented. The approach of the men whom we often met on the trails around Huila was usually first detected by the sound of the

pipes they play while walking along, unless their hands are kept busy plaiting braids of gynerium bark in the manufacture of their hats. This is the exclusive occupation of the men. Women almost invariably walk along spinning wool, their distaff under the left arm and the spindle in the left hand, while the right hand is busy at the wool.

The Paez maidens are fond of flowers and are very playful. On one occasion I observed several of them going up the hill beyond the river, in front of the church at Huila, their arms entwined about one another's necks; then they began running up the steep hill as in a contest of endurance. As they became exhausted they threw themselves on the grass, while their movements showed that they were playing and joking all the time. These children of Nature are not unpleasant to look at, except for their usual lack of cleanliness; nor are they wanting in coquetry, and they are often pretty. But in the presence of strangers they are extremely bashful, doing their utmost to keep in the background.

The old women are generally very ugly. Their clothing consists only of dirty rags, and their skin is covered with the filth of years.

Relations between the sexes, especially between husbands and wives, seem to be easy and without an air of superiority on the part of the former. On the few occasions that I had to entertain these people at their houses, the women took the same interest and the same part in the proceedings as the men, which was very different from what I observed among the Central American Indians.

Toward strangers, and especially toward Colombians of other races, the attitude of the Indians is decidedly hostile. Unless induced by the prospect of profit they will neither sell anything nor lend any service, often refusing money and accepting only articles which they especially desire. They will not allow white or black people in their homes, and at Huila they are even unwilling that the only white family living there should share the practically inexhaustible supply of fuel scattered about in the near-by forest, or have horses or cattle pasturing on the almost

THE WAX PALM (*Ceroxylum andicola*)

deserted savannas. It must be said, in extenuation, that they have been subjected to much abuse by their neighbors of the "superior race." Moreover, the Paeces are naturally hostile to strangers, descending, as we have seen, from a warlike people. The old Paeces always went about armed, carrying a lance or javelin in the hand and ready to protect their bodies from the darts of an enemy by means of a shield of basket-work (*opimb*), or of tapir hide (*χimba-kât*). The warlike tendencies of the tribe were stimulated by means of periodical contests in which the most valiant warriors fought each other in the presence of the multitude.

To-day, as we have seen, the descendants of these have abundant opportunity to satisfy their fighting propensity by taking sides in the frequent quarrels of the political parties that thus far have kept Colombia in an almost continual turmoil.

Sexual intercourse between Paez women and men of other races is said not to exist; barbarous chastisement would be the fate of the offending female. It is to be expected, however, that the closer contact brought about by the gradual penetration of the Tierra Andentro by whites and negroes will soon overcome the purity of the Paez blood and open the way to amalgamation with the neo-Colombian race.

Reclus, cited above (page 311), gives us to understand that the Paez were cannibals, and the tradition current in the villages along the western foot of the cordillera confirms his intimation with reference to the Pijaos; for the coming of "el Pijao" is still a menace to children. The early chroniclers tell us of several anthropophagous tribes which lived in this region, and it is not unlikely that the Paeces had a share in that custom.

GRAMMATICAL NOTES

Castillo's *Nociones gramaticales* is limited to a list of the personal pronouns and the conjugation of the verbs 'to be' and 'to write.' A few more grammatical indications are incorporated in the vocabularies, but on the whole these data are very meager, and much remains to be done in this direction.

I. — PHONETICS

Vowels

	a	*a*	*ä*		
e	*ē*		*o*	*ō*	*ô*
i	*ī*		*ü*	*u*	*ū*
ã	*ẽ*	*ı*	*õ*	*ũ*	

Consonants

		ḣ	*h*		
k	*g*	*χ*	*χ́*		*ñ*
tš	*dž*	*š*			
ts	*dz*				
t	*d*	*s*	*z*	*l*	*n*
p	*b*	*f*	*v*		*m*

In his introduction to Castillo's vocabularies, Uricoechea asserts, on the faith of the latter, that the Paez vowels are numerous, distinct from those of the Spanish language, and difficult of pronunciation. The Castilian language has only the five fundamental Latin vowels, while the Paez has three more, *ä*, *ô*, and *ü*, not including the nasalized vowels, which are not specifically distinct.

This can scarcely be called rich, but if by richness Uricoechea means euphony, then he is certainly correct. Indeed, the diphthongs *ai*, *eu*, *io*, *ua*, *ue*, *ui*, *uo*, recur with extreme frequency, and there are none of the half-mute vowels so often met with in the dialects of the Chibchan group. Again, it cannot be said that the Paez, in its present phonetics, offers any serious difficulty to the student so far as pronunciation is concerned. I have given careful attention to this special question, and think that the above table of vowels and consonants is fairly adequate to an exact transcription of the language.

When we come to the comparison of consonants we find that the Paez has all the consonants used in classical Castilian except the *z* (*ð*, English *th*), and that it has *χ́*, *tš*, *dž*, *š*, *ts*, and *dz* in addition. Here we may be justified in speaking of abundance, inasmuch as these fundamental consonants are accompanied by quite a formidable array of compound ones, either

initial like *bll, ft, kb, kl, kn, kp, ks, kt, mb, pk, pl, pš, pt, št, tsk,* or terminal like *fχ, kχ, pχ, mb, nš, nt.*

A further comparison of Castillo's material with my own shows three chief points of divergence in the transcription of words. One of them, namely, the prefixing of an initial *g* to words beginning with *ua* or *ue*, is general among Spanish authors, there being as much difficulty for a Spaniard to pronounce correctly that broad diphthong as to express any foreign word beginning in *st, sp*, etc., without an initial *e*. Just as a Spaniard will say 'estreet,' 'esprout,' 'estyle,' he is sure to pronounce 'gwatchman,' if not 'gwatchiman,' 'gwarbler,' and so on. This misspelling, then, may be regarded as an idiosyncrasy of our author.

A second difference, often repeated and which must be considered as an error in the reproduction of the original text, is that the words ending in my vocabulary in *ts, fχ, kχ*, etc., end respectively in *ti, fi, ki*, etc., in Castillo's vocabulary, the terminal *s* and *χ* having almost uniformly been mistaken for an *i*. Examples :

efi	for *efχ*,	eye-tooth.
equi	" *ekχ*,	fuel.
cafi	" *kafχ*,	gargante de.
cati	" *kats*,	hide, skin, peel.
conchi	" *kuntš*,	black.
miti	" *mitš* or *mits*,	pot.
tambi	" *tampχ*,	flank.

Unwritten languages are subject to rapid alteration. This is sufficient to explain the frequent change of *o* to *u*, and the suppression of the initials *a, e*, and *i*, in certain words. Following are a few examples of both cases :

ðoj	has become	*duχ*,	weight.
vito	" "	*ftu*,	tree.
guaco	" "	*uāku*,	tick.
onza	" "	*hunza*,	mouse.
ioc	" "	*iuk*,	wood, fuel.
aloch	is now	*lutš*,	child.
alauech	" "	*lauetš*,	lizard.

epench	is now	*penš*,	old (applied to female only).
isos	" "	*sus*,	urine.
atamp	" "	*taap*,	fog, cloud.

In Castillo's vocabularies *xs* stands for *š*, *z* for *ts* and *tz*, *ch* for *tš*. The final *h* is used only to prevent the coming together of the consonants *i* or *s* ending a word and the initial vowel of the following word in compound terms. For instance, we have *mesha*, for *més-a*, it is not; *izhe* for *its-é*, to join, to marry, etc.

II. — WORD-FORMATION

Remarks. — A few preliminary remarks as to the vocabulary given hereafter are necessary. In a general way it includes only words that are not found in Castillo's work. This is true especially of all isolated terms, but exceptions have been made when one of them is or contains a root of a whole family of words, in which case a few terms have been taken from Castillo's vocabulary and their orthography adapted to our own.

Among those words not included in Castillo's, some have simply escaped him, as, for instance, a number of plant names. But many others are to-day replaced by quite distinct expressions, and this is perhaps one of the strongest indications that the present Paez are in reality a mixture of the remnants of several ancient tribes, like the Paez, the Pijaos, the Jamundíes, and probably others, which resulted after Castillo's first survey of the language. As, with the exception of the Paez, we have not even fragmentary vocabularies of the tribes thus amalgamated, it is rather difficult to sustain such an hypothesis with linguistic testimony; but traditions still current and well-known examples of similar cases in other countries can be offered in support of it.

As we have in every case given Castillo's equivalent in the vocabulary, it is needless to reproduce here a list of the differences noted.

Compound Nouns. — The Paez language, like most of the languages belonging to the Chibchan group, has suffixes indicative of form, size, matter, people, etc., that characterize whole classes of words. Castillo's vocabulary being far from exhaustive and written in a somewhat capricious way, it is not always

easy to determine the words that form such families, and it remains for the future student to systematize and complete them. We are able, however, to give a few examples:

Kué is indicative of smallness, fragility, and is found also in several terms referring to childhood or parental relations. Examples:

kué	child.
a-kué	monkey.
ala-kué	child.
anš-kué	nephew.
anš-tsun-kué	grandson.
atš-kué	nephew.
doχ-kué	nephew.
etš-kué	orphan (phantom's son).
ñu-kué	uncle, father's brother.
pe-ñu-kué	aunt, father's sister.
tuku-kué (onomatope)	a small dove.
uesa-kué	girl.
ues-kué	thread.
uitša-kué	bird.

In the following words, however, the signification of the suffix is not apparent:

ak-kué	burial.
eiχ-ka-kué	ant.
ia-kué	ceremonial feather-dress.
ka-kué	body.
imeta-kué	dorsal spine.
ne-kué	challenge, contest.
sa-kué	heart of a tree.

Gué, meaning disease, is found as a suffix in a few known cases:

atša-gué	hectic fever (lit. hot-ache).
buts-gué	smallpox.
iaia-gué	intermittent fever.
su-gué	a medicinal plant.

Ñin signifies a small, round object, and is found in:

ipi-ñin	ember, red-hot coal (lit. fire-seed).
kigue-ñin	clay bullet, used with the blow-gun.
sogua-ñin	powder.

The verbal desinence *nās*, corresponding to the gerund tense, is largely used to form nouns that indicate condition or state, as in the following examples:

aknuk-nās	coward, from *aknuk*, to be frightened.
atš-kats-nās	tailor (*atš*, a piece of dress; *kats*, to sew).
do-nās	lying-in woman (*do*, to bring forth, to give birth).
fis-nās	the writer (*fis*, to write).
iās-nās	the one named (*iās-a*, to call oneself).
iāse-nās	he who baptizes (*iās-e*, to baptize).
ikas-nās	the chief, he who commands (*ikas-a*, to command).
ipons-nās	he who is powerful (*ipons*, the Pleiadés).
χip-nās	the owner (*χip*, to have, to own).
pang-nās	he who is sentenced (*pang*, to sentence, to condemn).
pas-nās	the stranger, he who arrives (*pas*, to arrive).
sikia-nās	he who knows (*sikia*, to know).
tóte-nās	the governor, he who talks loud (*tót*, to yell, to talk loud).
ukoments-nās	a kind of wasp.

It is also found that large groups of compound nouns have the same initial word, generally in the form of a monosyllabic prefix. Among them, two are of peculiar interest, on account of the apparent specialization of the prefixes *ne* and *pe*, the first of which seems to indicate only relationship, while the second is still more restrictive and refers almost exclusively to relations between father, mother, and children. The signification of *ne* is obscure; while *pe*, used as a prefix before a noun, evidently indicates the coming together of two or of several things or persons. Both groups have been incorporated in the vocabulary, as have a large group of verbs with the same prefix *pe*, but which have seemingly no relation to each other.

Formation of Adjectives. — A good number of adjectives also end in *kué*, but this suffix seems to correspond to a form of the

verb 'to be,' following what may be a noun or another adjective, and may be regarded as a predicate adjective or denominative verb:

ampa-kué, lean, sad.
ditš-kué, pretty (Cast.).
dšitš-kué, pretty (Pitt.).
dsuns-kué, frail, slender.
its-kué, lean.
lála-kué, small.
nu-kué, small, low, of a river.
o-kué, plane, even.
pats-kué, ugly.
pets-kué, thin, like paper.
uáts-kué, lazy.

It should not be inferred from the scarcity of this class of words in the examples given that the Paez language is lacking in them. On the contrary, a few examples show that, like many other primitive idioms, the Paez distinguishes gradations and categories in the qualities he attributes to an object or to different objects or persons. Thus, Castillo gives four different words for 'thick,' all of which, and one more, are still in use to-day. Now it is found that every one of them has a distinct signification or is applied in distinct cases:

fitse, thick, viscous, semi-liquid (of soup, mud, etc.).
χot, thick (of a tree).
ñiš, thick, stout (of a person).
iot, thick, bulky.
tat-a, thick or dense (of a forest, a jungle).

In the same way we have four expressions for 'large' three for 'soft,' etc., but without data to exemplify their use.

Reduplication is frequent in adjectives and seems to correspond to a superlative gradation.

The adjectives for 'young' and 'old' differ according to the sex of the person to whom they apply. The first is translated by *taki* when it applies to males, as in *pits-taki*, 'young man,' and by *kue-nas* when applied to females. 'Old' is *inš*, or *teé*, when referring to males, and *penš* (or *e-penš*) when used for females.

Formation of Verbs. — Owing to the brevity of my stay among the Paez Indians, I felt from the first a certain reluctance to enter into the intricate study of the verbs, fearing that, should

I begin it, I might be induced to accept *a priori* as true apparent rules which would then draw me into further mistakes. My former experience shows that a reliable comprehension of the infinite variations of the verbs, as bearing on flexion, derivation, etc., is not really acquired until one is fully cognizant of the spirit of the language to which they belong and is able to handle this almost as easily as his own.

In consequence of this, the few notes that follow are based mainly on the verbal terms included in Castillo's vocabulary.

(*a*) *Primitive Verbs.* — We find first that there are terms, expressive of condition, action, or motion, that can be considered as essentially verbal, and could be called, for simplicity's sake, "primitive verbs." Here are a few of them:

dé, to sleep
gúgu, to run
ios, to fly
kis, to fast
ktond, to carry
o, to eat
ô, to die
ôp, to shut, to close
os, to give
ós, to plant
ots, to work wood (labrar madera).
ôts, to burn.
peú, to beg, to ask.
pos, to stretch.
pot, to breathe.
ši, to attend, to serve.
šo, to take, to receive.
šunš, to soften, to knead.
tet, to beat, to knock.
tetš, to lick.
vis, to touch.

It is not unlikely that most of these verbs were originally nouns or adjectives, and that a few of them are still in use as such, although they do not so appear in the vocabulary. The following are given with a nominal, or a qualificative, and a verbal signification, and may be considered as true

(*b*) *Denominative Verbs* — susceptible of all flexions corresponding to person, mode, or time:

ampá-kué, sad, to be sad.
atšatš, warm; *atšaá*, to be warm (*b-atš*, to warm one's self).
ios-ó, standing, to be standing.
ipe-inka, thoughtful, to be thoughtful.
χuend, laying, to be laying.
paia-ki, careless, to be careless.

tšitan, hung, hanging, to be hanging.
éš, hiccough, to gasp, to breathe one's last.
is, rut, menstruum, to be in heat (applied to a female animal).
kami, to lie, lie.
kik-ki, light, to dawn.
kit, tooth; *kit-ik*, to lie on the abdomen (estar boca abajo).
ko-ia, food, to cook.
uetša, be merry, to be merry.

(*c*) *Verbal Prefixes.* — But more generally the transition from the adjective or from the noun is indicated by the prefix *i*, the exact sense of which is not clear. Thus —

ne-io, wife;	*i-io*, to marry (when the man marries).
ne-mi, husband;	*i-mi*, to marry (when the woman marries).
puns-a, arm-pit;	*i-puns*, to carry under the arm.
sus, urine;	*i-sus*, to urinate.
tóu, short;	*i-tóu*, to shorten.

Sometimes the radical word is already a verbal form, as in —

i-pi-ñas-á, to be jealous, to accuse; derived from *ñas-á*, to hit.
i-pot, to smell like; derived from *pot*, to stink.

In other cases of this class the prefix is *pe*, or *ka*, the meaning of which is equally obscure:

fiuts, to fix, to nail;	*pe-fiu*, to put together.
kit, a tooth;	*pe-kit*, to masticate.
tšantš, to suck;	*petšantš*, to suck.
gúgu, to run;	*ka-gú*, to roll down.
itse, to join;	*ka-itse*, to join, to put together.
kond, to break;	*ka-kond*, to carry off violently.
pang, to sentence;	*ka-pangó*, to punish.

III. — Parts of Speech

A. — *The Noun*

1. *Gender of Nouns.* — When gender is indicated, it is usually by means of suffixing the word *pits*, male, or *úi* (Cast. *ói*), female. Examples:

atall-pits, rooster;	*atall-úi*, hen.
de-pits, lover;	*de-úi*, sweetheart, concubine.

This rule, however, applies only to persons or animals. Plants and inanimate objects have no gender, so far as known. Moreover, many usual terms, mostly personal, have distinct forms according to sex. We have for instance:

doχ-kué, nephew;	*doχ-ués*, niece.
inš, grandfather;	*nentš*, grandmother.
e-ié / *ne-í*, father;	*ne-sí*, mother.
ne-mí, husband;	*ne-úi*, wife.
ne-tson, brother-in-law;	*ne-soú*, sister-in-law.
sat, cacique, chieftain;	*oša*, woman principal, cacique's wife.

2. *Number of Nouns.*— The prefix *pe*, already alluded to, may be considered as indicating duality; at least such is distinctly the case in the following instances:

pe-ndii, to be or to go together sister and brother.
pe-niiš, son and father, or mother and daughter.
pe-peš, to be or to go together brother and sister.
pe-tam, male and female, together.
pe-tsik, son and mother, or son and father, together.

Plurality seems to be indicated in most instances simply by means of the determinative *uei* or *guei*, many, except in the case of nouns designating persons, when the suffix *ueš*, or *gueš*, is used. But the same suffix appears also as a distinctive of collectivity, so that this point is not altogether clear. We have:

pits, man;	*pits-ueš*, men.
teé, adult;	*teé-ueš*, adults.

But also

E-ié-ueš	*hus*	*atšatš*	*meng-a?*	Did you annoy your father? (Lit. Did you make your father's hea t hot?)
father	heart	hot	made		

3. *Double Gender.* — It is interesting to find in the Paez language a few cases of what De la Grasserie in a recent work[1] calls "double gender," i. e., nouns that express in a single word the sex of the person who speaks and the sex of the person

[1] Raoul de la Grasserie *De la Catégorie du Genre*, Paris, 1906.

spoken of. These nouns all have reference to parental relations:

diš, brother of a sister.
epeš, sister of a brother.
iak-té, elder sister of a sister.
ne-iak, younger sister of a sister.
ne-ndii, brother of a brother.
ne-teé, elder brother of a brother.
pe-vi, younger brother of a brother.

B.— *The Adjective*

As in all languages of the Chibchan group, the Paez adjectives are invariable in gender and in number. The lists at hand are poor and incomplete, but the little we have seems to show a great choice of expressions to indicate degrees or shades in the use of qualificatives.

The superlative gradation seems to be indicated only by the adverb *atša*, 'very,' placed before or after the adjective. There is apparently no way to express a comparison.

C.— *Pronouns*

Our data on this subject are also very meager, and so incomplete that we are at a loss how to give any definite explanation.

In his *Nociones gramaticales* Castillo gives a table of the personal pronouns, from which we infer that there are two forms, according to gender, for both the subjective first and second person of the singular number. From the texts given by the same author, we also deduce that all the personal pronouns are used as possessive, and those of the third person as demonstrative.

In the conjugation of verbs the subject appears to be expressed chiefly by means of a suffix.

Following is Castillo's table:

I	Masc. *anki*, *antš* Fem. *oku*	we	*kue-k-uéš*, *kue-k-u*, *ku-k-ueš*
thou (you)	Masc. *inuí* Fem. *itša*	you	*in-k-ueš*, *i-k-ueš*
he, that	Masc. *kina*, *kiana* ?	they, those	*kina-k-ueš*

The middle *k* of the plural forms is inserted apparently for the sake of euphony.

D.—*The Verb*

As explained above, I did not endeavor to collect material for the study of verbs, by reason of the limited time at my disposal. Castillo's data are also very defective, but the paradigms presented by him as examples of conjugations are sufficient to afford an insight into the mechanism of conjugation. We reproduce the principal tenses with the object of showing that the verbal modifications referring to person, mode, and time, consist of a combination of the verbal root with the copulative or substantive verb and a suffix or ending that expresses the person. Our spelling differs somewhat from that used by Friederich Müller,[1] who had no practical experience with the language:

(1) To be:

Præsens

Singular	Plural
1st p. *anki-t*, I am;	*ku-k-ueš ta-u*, we are;
2d p. *inui-ng*	*ik-ueš ik-u*
3d p. *kiná-a*	*kiná-(g-)ueš i-a.*

Perfectum

1st p. *anki-kit*, I was;	*ku-k-ueš ta-u iô*, we were;
2d p. *inui-ng-iô*	*ik-ueš nek-u iô*
3d p. *kiná-k-iô*	*kina-g-ueš ta iô.*

Futurum

1st p. *anki-net*, I shall be;	*ku-k-ueš net-ka-u*, we shall be;
2d p. *inui-neng*	*ik-ueš nek-u*
3d p. *kiná-nen*	*kina-k-ueš pat-in.*

(2) To write, or to paint, *fis*:

Præsens

1st p. *anki fis-ats-t*, I write;	*kué-k-u-fis-ats-ta-u*, we write;
2d p. *inui fis-ats-eng*	*ik-ueš fis-ats-ku-a*
3d p. *kina fis-ats-k*	*kina-g-ueš fis-ats-tá.*

[1] *Grundriss der Sprachwissenschaft*, Bd. II, 358, Wien, 1882.

Perfectum

1st p.	*anki-t fis*, I wrote;	*kué-k-ueš ta-u fis*, we wrote;
2d p.	*inui-ng fis*	*ik-ueš ik-u fis*
3d p.	*kiná-k fis*	*kiná-g-ueš tink fis.*

Futurum

1st p.	*anki fis an-et*, I shall write;	*kué-k-ueš fis an-et ka-u*, we shall write;
2d p.	*inui fis an-eng*	*ik-ueš fis an-ek*
3d p.	*kina fis an-en*	*kiná-g-ueš fis a-tin.*

Castillo gives two more forms for the Præsens:

1st p.	*fis ats-it*, I am writing, or painting;	*fis ats-i-ta-u*, we are (etc.);
2d p.	*fis ats-ing*	*fis ats-ik-ua*
3d p.	*fis ats-ik*	*fis ats-i-ta*

and

1st p.	*fis n-op-t*, I am writing, or painting;	*fis op-ta-u*, we are (etc.);
2d p.	*fis op-nga*	*fis n-op-kua*
3d p.	*fis n-op-a*	*fis n-op-ta.*

The infix *ats* is an affirmative particle; *ôp* is a kind of auxiliary verb, corresponding with 'to be,' or 'to have.' The *k* and *g* of the plural forms (1st and 3d pers.) are simply euphonic intercalations.

The imperative tense is often formed by prefixing or suffixing *mä*, with a frequent elision of the *ä*, as in the following examples:

Tund-e-mä! Run! (Hurry up!)
Tata mä-palla! Go (and) call (your) father!
Atša-mä! Go away!
Kla m-ue (*mä-ue*)*!* Catch the cow!
Io m-pés! Give (me) water!
Mi-io! Come!

E. — *Borrowed Words*

(1) *From the Spanish.* — As might have been expected, we find in Paez quite a number of Spanish words, most of which are included in the following list:

kmisa,	for *camisa,*	shirt.
kneia,	" *guineo,*	a variety of banana.
kiso,	" *queso,*	cheese.
ktšil,	" *cuchillo,*	knife (machete).
kutši,	" *coche,*	pig.
letši,	" *leche,*	milk.
mama,	" *mamá,*	mother.
mil,	" *miel,*	honey.
pango,	" *banco,*	bench.
sap,	" *sapo,*	toad.
senda,	" *cinta,*	ribbon.
šlapon,	" *eslabon,*	fire-steel.
ticle,	" *tigre,*	jaguar.

(2) *From the Kitšua.* — In describing the territory occupied by the Paez and the neighboring tribes which later became consolidated with them, we have seen that it was, and is still, in close proximity to the northern end of the area occupied by the Kitšua (see the map, plate 1). Intercourse between these peoples has been necessarily frequent, and many words have become common to both languages. Castillo's editor, the late Professor Uricoechea, obtained a list of some of these words from Mr G. Pacheco Zegarra, who had perused Castillo's vocabulary. To these I added a few, notwithstanding which the list still remains very incomplete, as the lack of an extensive Kitšua dictionary, including the northern dialects, forbade any further effort on my part to make it longer:

Paez	*Kitšua*
akots, cinder	*akku,* cinder
atsi, to sneeze (onomatope)	*atsii,* to sneeze
atall-pits, rooster	*atall-pa,* rooster
anaku, part of woman dress	*anaku,* part of woman's dress
ás-a, to stink	*as-nana,*
atša, very	*atša* (*antša*), much, very
alko, dog	*allko,* dog
aú, yes	*aú,* yes
kipa-ki, to overtake by following	*kipa,* behind, after
killim, drivel, dirt	*kelli,* drivel, dirt
kandul, vulture (condor)	*kuntur,* vulture
ia-yi, blooming sugar-cane	*ia-yin,* blooming sugar-cane, also a vine

killka, paper, letter, book	*killka*, paper, letter, book
katšoni, to lick	*katšoni*, to bite
kikin, again	*kikin*, again
kakka, father-in-law	*kakka*, father-in-law
laki, lax, feeble, lazy	*llaki*, feeble faint, sad
mutšai, to kiss	*mutšai*, kiss
miš, cat	*misi*, *mitši*, cat
miski, honey	*miski*, honey
muti, boiled corn	*muti*, boiled corn
ña, to complete, to finish	*ña*, so (Span. *yá* ! yá se acabó = *ña*)
ñusa, sugar-cane, sweet cane	*ñuk-ñu*, sweet, applied to any fruit
piñu-skia, to hate, to quarrel	*piña-tsina*, to be angry
pisko, turkey	*pišku*, bird
puki, watershed	*pucyu*, watershed
pein, to ask	*pin ?* who is it ?
tšumbe, sash to support the *anaku*	*tšumbi*, sash, girdle
tšpi-pi, turkey	*tšumpi*, brown
ukupa-ki, to push	*ukupa-tšii*, to push
uás, a hut	*huási*, house
vite-pasak, one hundred	*patšak*, one hundred

(3) *From other Languages.* — It is likely that the Paez language borrowed many other terms from neighboring tribes, but thus far we lack the necessary material for comparison. As explained above, since Castillo's residence among these Indians their language seems to have undergone considerable change, especially in its vocabulary, a fact readily explained if we admit that the present Paez are composed of the remains of several tribes, greatly reduced in number by their wars with the Spanish conquerors and the hardships they suffered after their submission to the new rule. With the Chibcha, the analogies seem reduced to the rules of construction, the vocabulary being totally distinct.

F. — *The Numerals*

1. *Ias*, *vitetš*	*tetš*
2. *Ens*	*ens*
3. *Tek*	*tek*
4. *Pans*	*þans*

5.	*Tats*	*tats*
6.	*Sanki*	*tesets, tesekχ*
7.	*Ens-sanki*	
8.	*Tek-sanki, puki-pans*	
9.	*Pans-sanki*	
10.	*Kose-pemba*	*ksemba*
20.	*Ens-kose-pemba*	
30.	*Tek-kose-pemba*	
40.	*Pans-kose-pemba*	
100.	*Pasats-tša, vite-pasak*	
1000.	*kose-pemba-pasáts-tša*	

As indicated by the above examples, the Paez Indians formerly counted upon their fingers, so that their numeration was necessarily decimal. It is difficult, not to say impossible, to determine the meaning of the word *sanki*, for 'six,' but it seems to have been, as Castillo expresses it, a base for the series between five and ten. Thus *ens-sanki*, means the 'second six'; *tek-sanki*, the 'third six'; *pans-sanki*, the 'fourth six.' We also find that *puki-pans*, a second expression for *eight*, means the 'return of four.'

Kose-pemba, ten, means 'the hands completed,' an expression similar to that found in many other primitive languages. At present this system is found only in a mutilated form, including the numerals one to six, and ten. For other numbers Spanish is used. *Vitetš* has become reduced to *tetš*; and another expression, meaning apparently 'second one' (*tetš-ens*?), has been substituted for *sanki*.

IV. — Vocabulary

The following vocabulary includes all words collected by the author and not found in Castillo's work, and also expressions of the latter that complete families of words with a common root. *H* means Huila, and *T* Tacueyó, villages in which words were collected. *Cast.* signifies Castillo; *Span.*, Spanish.

a, an (*anš, atš*?)	mine, my; our, ours
a-euχ (T), *ia-euχ* (H)	eye — Cast.: *ia-fi*
á-euχ (T), *guâ-gua* (H)	*Inga edulis*, a tree
alko (Kitšua word)	dog

álko + *mut-kué*	*Solanum mammosum*, a plant; Span. *tetilla*
ain + *do* (T)	son-in-law. See *anš-induχá*
ain + *lútš-kua* (T)	son — Cast. has *ne-tšik*; in the modern word is found the root of *a-lotš*, medieval word for boy, or girl
anio + *ũés* (T), *pũs* (H)	the Pleiades, a constellation
anš (nasal *a*, *ãš*)	may signify my, mine
anš + *induχá* (H)	son-in-law
anš + *kué* (H), *atš* + *kué* (T)	nephew — Cast.: *doχ-kué*
anš+*máma* (H), *máma*+*señor* (T)	maternal grandfather
anš+*táta* (H), *táta*+*señor* (T)	paternal grandfather
anš + *táta* (H), *atš* + *káka* (T)	father-in-law
anš + *tsún-kué* (H), *a-tsún* (T)	grandson
anš+*uasák-ua* (H), *atš-uáset* (T)	niece — Cast.: *doχ-ues*
anš + *úi* (H), *atš-úi* (T)	wife — Cast.: *ne-íó*; see *úi*
ap	fly
ap + *ués*	mosquito — (*ués* means worm)
âtã	moon, month
âtã-lutš	crescent moon
âtã-lutš-a	new moon
âtã-tansa (T), *âtã-tansia* (H)	waning moon
a-tsún (T), *anš-tsún-kué* (H)	grandson — Cast.: *ne-tsom* (*tsom* = *tsún*)
atš (onomatope)	to sneeze
atš	ruana, a piece of native dress
atš + *kas-nas*	tailor (*kats* = to sew)
atš + *petš*	a piece of native male dress — Cast.: (*atipetš*)
atš + *tul*	a piece of woman's dress
atš + *kué* (T)	nephew
atš-ua-set (T)	niece
atš-úi (T)	wife; see also *anš*
atú, *atún* (H)	bed — Cast. has *de-ki-ue*; *dé* = sleep, *ki-ue* = place: a place to sleep
bamb (H)	shoulder — Cast.: *am-bamb*

ben-džiki (H)	pillow — Cast. : *pe-ki-dé-ki*
biún, vió, viún (H) *biún* + *mbé* *biún* + *tšime*	money — Cast. : *gué-ió* gold — Cast. : *gue-ió-mbé* silver money (Span. *plata blanca*)
bús	fly — Cast. has *ap ; buts* is a small beetle that eats maize and other crops when they show their first leaves.
butša	trumpet-tree (*Cecropia* sp.)
bútš	*Salvia* sp., a labiate plant — Span. : *parendera*
dé *dé* + *χek* (T) *dé* + *χ ek-a* (H) *dé*+ *ki-ue* *dé* + *ntš* *dé* + *pits* *dé* + *s-e* *dé* + *úi*	sleep to sleep to sleep bed (= place to sleep) sleepy, lazy lover to sleep (Cast.) concubine
dits *dits* + *kak* (H)	egg penis
di-ua + *kátš* (T), *i-uä-káts* (H)	mouth — Cast.: *i-ué*
dsit (H)	bone — Cast.: *dit*
dsits (H)	testicle
dúχ, dunk *dúχ-a*	heavy — Cast : *doχ*, to weigh very heavy
dži, zi	trail, path — Cast.: *di*
dziχ (H), *nasé-umä* (T)	medicine-man — Cast.: *diχi*, hechicero
džik-io (T), *úi* (H)	woman, female
džik-tä *džik-tä nasa dzik-tä* (H), *džit* (T) *džik-tä*+*tupχ* (H), *iχ-kuát-kátš* (T)	head — Cast.: *dik-té* skull forehead
džip	face — Cast.: *dip*
dzúns-kue	thin, slender — Cast.: *pés-kue*
džét-euχ	*Rhus juglandifolia*, a poisonous tree
é, hé	field (Span. *roza*), blood

é + *posta* (T) *é* + *psa* (H)	jungle, old field (Span. *rastrojo*)
é + *ué-tse* (H)	artery, vein
eſχ́,	eye-tooth
ékχ́, *ék-χe*, *etš*	fuel, timber — Cast.: *ek-i*
ens	two
ens + *tša usta*	few
ens, *ẽs*, *sek*	spring, dry season: according to Cast. *ens* or *ẽs* means also to fish; the dry season was called *ens-te*, i. e. fishing time, because the Indians fished only while the rivers were dry
é-piã	midday
és	louse
éš	coca
é-ša-ü (H), *-é-še-ui* (T)	antbear — Cast.: *e-šo-bi*
éski-uet (H)	hip
éts	humming-bird (Span. *tominejo*)
etš	phantom, dumb
etš + *guati* (Cast.)	carángano, large louse
etš + *kué*	orphan (= phantom's son)
etš + *úi* (T) *etš* + *úi-ia*	widow (phantom's wife)
e-ué, *pén-ze*	shooting-star (Cast.: *bitši-tin*)
ftũ	wood, tree — Cast.: *vito*, *vitõ*
ftũ + *hiúh*	wood
ftũ + *kás*, *ftũ-kats*	bark — Cast.: *cati*
ftũ + *tás*	root
ftũ + *tšap* (H)	post — Cast.: *nonepá*
ftũ + *tsime*	*Tibouchina lepidota* Baill., a small tree with showy flowers
fué (H)	ladder — Cast.: *agué*
gua-kás (T), *iué-kás* (H)	beard, bearded or white man — Cast.: *gue-gas*, *iu-gué-kas*
guáχ́, *ué*, *lutš-ué* (H)	hammock
hak (H)	cough
hákai-bil (T), *tú-pil* (H)	a myriapod (Span. *centopiés*)

hã (H)	blood
hin-ze, kús-utsa	the afternoon — Cast. : *finze*
hiú, χiú (H)	trousers
hún	to grind
hún-ku-kuét, lúl-kuet (H)	grinding-stone — Cast.: *hune kuet*
hunza	mouse — Cast.: *onza*
hũs (H)	heart — Cast.: *agnus*
húpe (H)	fence, hedge — Cast.: *ka-find*
hu-úk (H)	death
iá-a-ués (H)	net
iá-euχ (H), *a-euχ* (T)	eye — Cast.: *ia-fi*
iá-euχ + káts (H) *iá-χ + katš* (T)	eyelash
iéf-dzi-ke (H)	tears
iánš,	volcano
iáš,	*Datura arborea*, a small tree, with large white flowers, having narcotic properties
iek-tãín (T)	brother
iek-tãín neeš-te (T)	elder brother — Cast.: *ne-teé ; teé* = old
iek-tãín nutš (T)	younger brother
iek-té (H)	brother
iek-té inté-ha (H)	elder brother
iek-té-nutš-kua (H)	younger brother
i-kats (Cast.)	to dress (when a man dresses)
i-kats-atš,	inner piece of dress, a kind of shirt
i-kuét (H)	knee, knee-cap
ins,	to dress (used by females only)
ins-atš,	inner part of female dress
io-íts, íts-io	bunch
ip, ibš	light, candle — Cast.: *ip-i*
ip + e-uála (T)	fire
ip + iá, á	smoke
ip + ik-púts	spark
ip + imbe-χetsa (H)	fire
ip + i-ñin	embers, red-hot coal

i̯p + *iot*	fire-place (Cast.)
i̯p + *kat* (H)	hearth, fireplace
i̯p + *kuét*	hearthstone (Cast.), flint (T.)
i̯p + *peéti*	flint (Cast.)
i̯p + *ons*	the Pleiades, a constellation
i̯p + *sik* (T)	firebrand
i̯p + *tšanťša*	coal (Cast.)
i̯p + *tšik* (H)	firebrand
ĩš	old — Cast.: *ins*
ĩš-kua	old, old man
ĩš-kats	hair on the body of grown people
ĩts	nose — Cast.: *ints*
ĩts-k-aeu̯χ (T), *ĩts-kafχ*	nostrils — Cast.: *ints kafi*
itš-kué	lean — Cast.: *tso-e*
itš-kué-a	very lean
iú	silver
iú, *ió*	water
iú + *ak-ñi* (H)	wound
iú-g-uála (T)	river, stream — Cast.: *io-mbo*
iú + *its*	headwaters of a river.
iú + *kar* (T), *iú* + *letš-kuá* (H)	brook, spring
iú + *puká*	border, river bank
iú + *ši* (T), *iú* + *ši* (H)	otter — Cast.: *io-ši*
iú + *uál* (H)	river, stream
iúk (H)	breech — Cast.: *kuts*
iúk	wood, forest — Cast.: *iok*
iúk + *ia-ués* (T), *tag-ia* (H)	vine
iúk-péko (T), *iúk-puka-so-iúk* (H)	forest edge
iúk-ua (H), *kbám-ba* (T)	chin
iu-ué-gua	peace
χimba	horse
χimba + *blill* (H)	hoof
χimba + *kât*	shield (Cast.)
χimba + *kutš*	tapir
χímbe-kué-kué (H)	thigh

χiu	long — Cast. : *io-ios*
χiú-ka	all
χút (*hiút*, *iút*)	herb — Cast. : *iot*
káfi (T) *kafχi* (H)	ditch
kak	baked
kámbo (T), *támbo* (H)	stick, young tree
kamút (T) *kuéta* (H)	drum — Cast. : *kimb*
kantš	ugly
kás (T) *káts*	skin, hide, peel — Cast. : *kati*
kénse	gullet
kia-tšá	only one (Span. : *uno no más*)
kít	tooth
kít + *aka*	toothache ; *aka* = ache, pain
kít + *eniš* (T), *tsuté* (H)	molar tooth — Cast. : *toza*
kits	clay
ki-ua *ki-ué*	soil, ground, native — Cast. : *ki-gue*
ki-ua + *kutši* (H) *ki-ua* + *kutšo* (T)	wild hog (*Dicotyles tajacu*) ; Span. : *tatabro*
ki-ué + *nia*	cassava-root (*Manihot utilissima*)
ki-ué + *ptumb* (H), *tukúk* (T)	very small wild dove (*Columbi-gallina* sp.)
kla	cow, cattle
kla-kats	cowhide
klauetš (T), *lauetš* (H)	lizard — Cast. : *alahuetš*
kpĩš, *era-kpĩš*	thunder — Cast. : *kapiš*
kpĩš + *kueχ-nek*	lightning — Cast. : *kuene*
kpĩš + *ué-ue-tsa*	storm
kpĩš + *úχ-tšek*	it thunders hard
ktúme	eye-brow — Cast. : *atonkas*
kuéb-kué (H)	body — Cast. : *ka-kué*
kué-kue-sék (H)	fever — Cast. : *iaia-gué*
kuét	stone
kuét + *kosi* (T), *lúl-iá* (H)	pestle (Span. : *mano de piedra*) — Cast. : *kuét-akike*, *lol-tšik*

kuét + *múš*	stony beach, stony field (Span.: *pedregal*)
kuét + *musé*	sand
kuét + *škin* (T) *kuét* + *šin* (H)	flint
kuhuí (H)	lung
kuíχa	food — Cast.: *koí-ia*
kukχ́ (H) *kutš-kál*, *kutš* (T)	corn — Cast.: *kokavi*
kukχ́ + *bä*	red corn
kukχ́ + *kuntš*	black corn
kukχ́ + *teuí-i* *kukχ́* + *tví*	corn-ear
kukχ́ + *tšime* *kukχ́* + *ná-ua*	white corn
kukχ́ + *unde-âte*, *unten-âte*	harvesting season
kuntš	black — Cast.: *kontši*
kúpi, *lutš-kupi* (H)	birth
kús, *kúsku*	evening, night — Cast.: *kos*
kús + *ía* *kús* + *íi*	the morning — Cast.: *kos-kài*
kús + *utsa*, *hinze*	afternoon — Cast.: *finze*
kusä	hand — Cast.: *kose*
kusä + *bía* (H)	finger
kusä + *bía néfueš*	major finger
kusä + *bía nútš-kué* (H)	little finger
kusä + *gúla* (H)	thumb
kusä + *múš* (H)	hand
kusä + *péts* (H)	wrist — Cast.: *kose-peti*
kusä + *pil* (H)	fore-arm
kusä + *pop* (H)	palm of hand
kusä + *uétse*	tendon
kusä + *úns* (H)	pulse
kus-bé (T), *úl* (H)	snake — Cast.: *ol*
kzuns, *tzuns*, *tsuts*	thorn — Cast.: *tsons*
láme	wax-palm (*Ceroxylum andicola*)
lantš	a large rodent (*Cavia* sp.)
letš-kua	small, narrow, low
létš-kué tsa	piece, fragment
lúl	to grind — Cast.: *lol*

lúl + *ia, kuét-kosi*	grinding pestle (Span. *mano de piedra*)
lúl + *kuét, kunku-kuét*	grinding stone
lúl + *tšik*	small grinding-stone
lutš	child, male or female — Cast.: *alotš*
lutš (H), *aín lutš* + *kua* (T)	son
lutš-kúpi (T), *kúpi* (H)	childbirth
lutš-ué, ué (T), *guaχ* (H)	hammock (*lutš-ué*=child-bridge)
maíkχ	few, several
makénio	Tahiti plantain
máma (H), *painš* (T)	mother
mámá + *señor* (T), *anš* + *máma*	maternal grandfather
map !	pull out !
mem	*Carica* sp., a wild pawpaw tree
méns (H)	tail
mä	excrement — Cast.: *ime*
mä-aín (H)	liver — Cast.: *mé-ki*
mä-tú (H)	bowels — Cast.: *ime-tó*
mä-ué	buzzard — Cast.: *ime-gnuei*
men-gué (H)	dysentery
mitúnχ	beverage
mótši, mutši	a corn meal — Cast.: *múti*
muéi-hi	tobacco
mum, afid	a tree with long, broad pods (*Inga* sp.)
musé	sand
naín (H)	stomach
nása	Indian. According to Cast. *nása* means any being; at present it means people (*gens*), but applies to Indians only
nása + *pents* (T)	grandmother — Cast.: *epentš*
nása + *pitš-te* (T)	man, Indian — Cast.: *pits*
nása + *piχts* (H)	man, Indian
nása + *úi* (T)	woman, Indian
náse + *umä*	medicine-man, sorcerer
nãs + *ma-kuie-iua*	market

ne + *enš*	grandmother
ne + *hí*	everyone's mother (Cast.)
ne + *i*	father
ne + *iafi* (Cast.)	first-born
ne + *iak*	sister of a sister
ne + *iò*	wife, spouse
ne + *kué-uñió*	daughter in law
ne + *mí*	husband, spouse
ne + *ndii*	brother of a brother
ne + *ši*	mother
ne + *sóu*	sister in law
ne + *tée*	elder brother of any two
ne + *tot*	more powerful, also Pope (Cast.)
ne + *tšik*	son
ne + *zom*	grandson (Cast.)
ne + *zon*	brother-in-law (Cast.)
nete	end, earthquake
niòns, *niúns* (H)	needle — Cast.: *nonz*
niš	thick, stout — Cast.: *di*, *di-up*
painš (T), *máma* (H)	mother — Cast.: *e-pe*, *ne-ši*, *ñi*
pambe + *atš*	part of female dress
pe	indicative of pairing, collecting, or of coming together, of two or several things or persons of the same kind
pe + *fiú*	to unite, to bind together
pe + *kak*	to collect or bring together many things
pe + *ña*	to increase, to add
pe + *ndii*	to be or to go together sister and brother
pe + *niíš*	son and father, or son and mother
pe + *núk-ue*	aunt, father's sister
pe + *peš*	to be or to go together brother and sister
pe + *tam*	male and female together
pe + *tsuts*	mother-in-law, aunt, father's sister
pe + *ntsii*	the fence around a grave, made of many sticks tied together
pe + *tšik*	son and mother, or son and father
pe + *vi*	younger brother
pend + *átau* (H)	burial

pénš	old, when speaking of a female — Cast. : (*e-pentš*)
pénš + *kué*	old woman, grandmother
péš	sister of a brother
péš + *núi-tain* (T) *peš* + *nu-te* (H)	elder sister of a brother
péš + *nútš* (T) *péš* + *nutš-kué* (H)	younger sister of a brother
péts (H)	sweat
pets-χíta	throat
pian džán usta	half
pikas	beam
pindo	*Gynerium saccharoides*, a tall grass used in making hats
pinzó	*Alnus* sp., the South American alder
pipšo	bijao (*Heliconia* sp.) a plantain-like plant
pipšo + *knieia* (T) *pipšo* + *kneia* (H)	dwarf plantain
pisko (H), *tšpi-pi* (T)	turkey (Span. : *bimbo*, or *chumpipe*) ; both Paez words are derived from the Kitšua
pitška	a variety of large tick — Cast. : *guakó*
pižá	sheep — Cast. : *kapiša*
pkind (T) *pkind* + *a* (H)	guava tree (*Psidium guajava*)
pkind + *a-iún* (H) *pkind* + *bits* (T)	guava, fruit
plán (T)	plantain
plán + *debéh*	manzana, a variety of banana
plán + *d-its*	ripe plantain
plán + *kák*	baked plantain
plán + *káts*	plantain peel
plán + *tskúχ*	boiled plantain
pšũ	shade — Cast. : *pnasá*
puél	*Tropæolum tuberosum*, a plant with edible tubers

pús — strong (in flavor)

šal — *Phyllanthus* sp., a small euphorbiaceous tree, the leaves of which give a black dye

satsâm — iron

sek — sun — Cat.: *itaki, taki: sek* also signifies dry season, and heat of the sun

šimb (T), *úsa* (H) — young, half-grown maize, just before tasseling

šimbe — puma — Cast.: *ši*

šisten — heap

šisten + *ôpta* (Cast.) — to be heaped — *op* = all

šlal — a passion flower the fruits of which are edible

soná — *Stylanthes guianensis*, a plant

sú (T), *sú-uá* — sister-in-law — Cast.: *ne-sóu*

sus-tó — belly — Cast.: *to-ti*

šám-pu (H) — navel — Cast.: *šamb*

štá-pando (H) — broom

štu-káfi (H), tkâfχ (H) — hole

šuíl (H), *tsevi* (T) — *Ullucus tuberosus*, a plant with edible tubers

tá, tã — mountain — Cast.: *atšú*

ta-úla — mountain group, mountain range (*serranía*)

támbuš (H), *tšbim* (T) — occiput

táuχ — strap

teé — calabash used as a plate or cup

titš, tšitš-iat (H) — wall

topát — blow-gun—Cast.: *vito-pát*; Span.: *bodoquera*

tópi-túpia — clean, free of obstruction

tsaifχ (H) — upper-arm

tsavi-é, uats tsa-eu	burnt field (*roza quemada*)
tsam	sand
tsik (H)	collar, neck — Cast.: *tine*
tsins (H)	back
tsi-tsi-ué, tski-ua	country, native land
tskúχ (T), *kuiχa* (H)	boiled
tsméχ-me (H), *tsuá-uχ* (T)	butterfly
tsuá-ua	*Miconia æruginosa* Naud., a shrub
tsufχ (H)	swelling — Cast.: *ekoló*
tsun	brother-in-law — Cast.: *ne-tsón*
tsũt	tender, edible corn — Cast.: *šipi* (Span. of Cauca: *choclo*, from the Kitšua)
tsute	*Weinmannia* sp., a small tree
tšáeu (T), *tšaü* (H)	a large deer (*venado*) — Cast.: *tsaví*
tšáeu + *šbam* (T) *tšáü* + *bétš-kua* (H)	a small deer
tšahú	pineapple
tšánga	*Sida* sp., a woody weed
tšán-tsa	strong (in vigor)
tse-ua-uá	*Miconia æruginosa* Rand., a bush
tšínda (H)	foot
tšínda + *káka* (H)	ankle
tšínda + *me-tú* (H)	calf of the leg
tšínda + *pil* (H)	foreleg
tšínda + *pop* (H)	sole of the foot
tšínda + *tanš* (H)	heel
tšínda + *vits* (H)	foot-finger, toe
tši (Cast.)	*Gynerium saccharoides*, a tall grass
tšits	roof
tšits-uá (T), *tsitš-ualá* (H)	quagmire, swamp
tškás	hair — Cast.: *dikas*
tštá-túnt	dust
tšuá	hat — Cast.: *-étšuá*

tšuátš — louse, a very large variety called *carángano* by the Spanish natives — Cast.: *etš-guati*

tsui (T), *úkua-pits* (H) — husband — Cast.: *nemi*

tsutš — woman's breast—Cast.: *hiki*

tukué-tsé — *Relbunium hypocarpium*, a plant the roots of which give a red dye

tulú (H) — plantain — Cast.: *tolo*; see also *plán*

tulú + *kak* — baked plantain
tulú + *káts* — plantain peel
tulú + *kuiχa* — boiled plantain
tulú + *its* — ripe plantain

túng-ua (H), *tú-ue* (T) — ear — Cast.: *tógnue*
túng-ua + *kafs-iaka* (H) — ear-ache
túng-ua + *vits* (H) — ear-lobe
túng-ué-ieki — earring
túe-kafχ (T) — vent hole

túpa — spider

túta (H) — first

uáka — crab

uála — large, high, tall — Cast.: *gula*

uán-dziúns (H) — fishhook

uása-kua (H), *guása-ko* (T) — daughter, girl

uats-to, *uatš-ta* — tired

uá-tsa — necklace

uéll — parroquet

uense — agouti (*Dasyprocta* sp.) Span. *cučacusa*

uentš — fish — Cast.: *gneundi*
uentš + *patsí* — a large, iguana-like lizard

ués (H), *guás* (T) — earthworm — Cast: *gues*
ués + *kué* — thread

ué-ue-nié (H) — voice, word

uéχa — wind — Cast.: *pneuma!*

úi	maiden, woman, female — Cast.: *ói*
úi + *éume*	prostitute
úi + *kuí*	female child
uin-dža (H)	elbow — Cast. : *fitsa*
uklė	*Equisetum* sp., a cryptogamous plant
ulmė-suk	*Daucus montanus* Willd., a plant
unpetš (T)	temple (of the head)
únze-kaš (H)	arm-pit — Cast. : *punza kafi*
ús (T), *hús* (H)	bean, kidney — Cast. : *os*
ús + *babino*	pod, bean-pod
ús + *bė*	red bean
ús + *kutš*	black bean
us + *mitš*	scorpion
ús + *uál*	*Erythrina edulis* Triana, a leguminous tree, with edible seeds
útse (T), *úχtse* (H)	alligator pear — Cast. *oze*
utšitš	diarrhea
úχ	sparrow-hawk
viiχ (H)	finger-nail
vília	sash, woman's belt
viš-viiχ (H)	claw
vitš	door — Cast.: *vite*
vitšėk, *vitšėk-ua*	bird — Cast.: *vitšak-ue*

THE CHEYENNE INDIANS

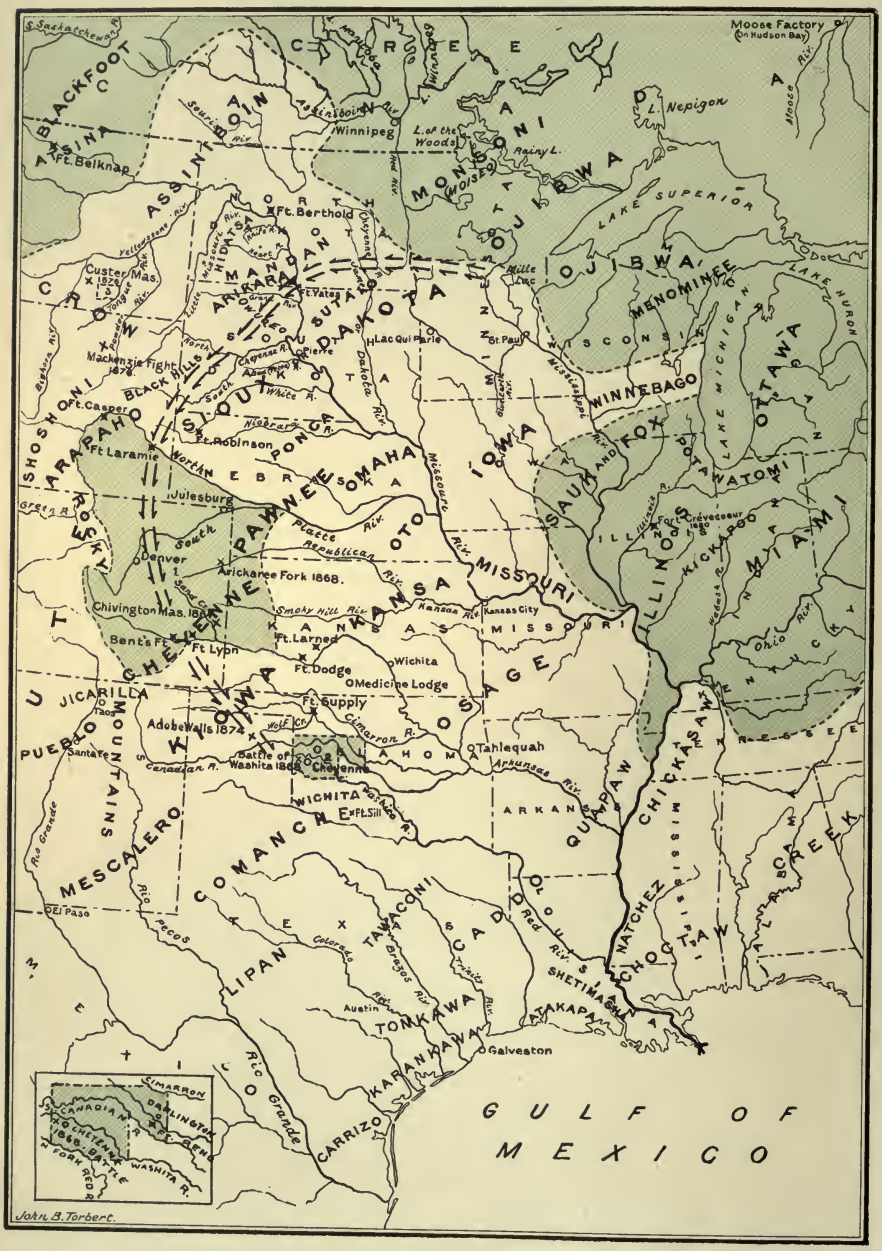
BY

JAMES MOONEY

"In their wild and savage way they fought well for their country."

CONTENTS

	PAGE
Historical Sketch	361
Synonyms	361
Early habitat and migrations	363
Traditional tribes and alliances	368
Contact with early travelers	373
First treaty—Removal to the Arkansas	376
Fort Laramie treaty—First Cheyenne war	378
Gold rush to Colorado—Fort Wise treaty	382
Outbreak of 1864—Chivington—Hancock—Medicine Lodge treaty	384
Outbreak of 1868—Aricaree fork and the Washita	389
Outbreak of 1874–75—Adobe Walls—The Southern campaign	391
The northern campaign—Custer massacre—Mackenzie	395
Flight of the Northern Cheyenne	397
Later history—Civilization, allotment, and citizenship	400
Population	402
Organization	402
The camp-circle divisions	402
Basis of tribal organization	408
Warrior organization—Other societies	412
Heraldic system—Religion—Home life	417
Algonquian affinity—Linguistic material	419
Indian culture not ancient	420
Names given to other tribes	421
Cheyenne bibliography	428



MIGRATION AND HABITAT OF THE CHEYENNE

P. P. C.
Ind. 16.1.

THE CHEYENNE INDIANS

By JAMES MOONEY

Historical Sketch

SYNONYMS

CHAA. — La Salle, 1680, in Margry, *Découvertes*, II, 54, 1877. *Variants:* Chawa, Sha-i-a-pi, Shara, Sharha, Shaway, Shawhay.

CHEYENNE. — *Rep. Com'r. Ind. Aff.* for 1835, 297. *Variants:* Chaguyenne, Chayenne, Chian, Chien, Chyanne, Schianese, *Shaiena*, Shienne, Sianavo.

DZĬ'TSĬSTÄ'S. — Name used by themselves; apparently from a root signifying 'our people,' or 'people like us,' but possibly from another root signifying 'gashed,' as perhaps also indicated by the tribal sign. *Na tsĭ'stäi*, 'I am a Cheyenne.'

SIGN. — Right index finger drawn several times across left index finger; variously interpreted 'cut finger,' 'cut wrist,' 'scarred arm,' 'striped arrow.'

Aside from their acknowledged importance as a powerful and warlike Plains tribe, the Cheyenne are of special interest to the ethnologist as a rare instance of a sedentary and agricultural people cut off from the main body of their kindred and transformed by pressure of circumstance within the historic period into a race of nomad and predatory hunters, with such entire change of habit and ceremony that the old life is remembered only in sacred tradition and would seem impossible of belief but for the connected documentary proof of the fact. The Cheyenne chasing buffalo on the Staked plain were a stumbling block in Algonquian philology. The Cheyenne planting corn in Minnesota, in friendly neighborhood to the Ojibwa, are a perfectly feasible Algonquian proposition. Practically all that they have today of tribal life and ceremony, excepting the Medicine Arrow rite, has been acquired in the course of this migration, and the oldest things date back not more than two centuries.

The following notes are chiefly the result of investigations

made during the last five years among the Southern Cheyenne under a joint commission from the Bureau of American Ethnology and the Field Museum of Natural History, Chicago, and supplemented by information derived from visiting Northern Cheyenne and from printed and manuscript sources. Some preliminary investigation had been made in connection with the study of the Ghost dance in 1891–92,[1] and during short visits in subsequent years. As the work under the joint commission required an exact knowledge of the arrangement of the tribal camping circle, special attention was devoted to this part of the subject. The statement here given of the names, pedigrees, and comparative rank of the several tribal divisions is believed to be nearly as correct as can be obtained from their own best informants of today, and is intended to supersede the author's earlier list in the Ghost Dance report.

Of eighty-five names for the Cheyenne, tabulated in the *Handbook of American Indians* now in course of publication by the Bureau of American Ethnology, the great majority are variants of the name given to them by the Sioux, and crystalized in the French spelling as "Cheyenne." They call themselves *Dzĭtsĭ'stäs*, a name equally capable of interpretation as 'people of our kind,' i. e., 'our people,' or as 'the gashed ones,' according as it may come from *ĭ'tsĭstau*, 'like this' (animate), *ehĭstä'*, 'he is of the kind,' or from *éhĭstä'ĭ*, 'he is gashed.' Although the second rendering would agree with a common interpretation of the tribal sign and has the support of some good authorities, I am inclined to think, from analogy with other tribal names and from the opinion of the Indians themselves, that the first meaning is the correct one. The popular name has no connection with the French *chien*, 'dog,' as has sometimes erroneously been supposed, but is derived from the name by which the Sioux call them, *Shahi-yena*, *Shai-ena*, or *Shai-ela*, meaning 'people of alien speech' (Williamson; Riggs), the same name being applied also by the Sioux to the Cree in Canada.[2] In the sign language they are indicated by a gesture

[1] *Fourteenth Annual Report of the Bureau of Ethnology*, 1896.

[2] See also Sioux testimony in *South Dakota Hist. Coll.*, II, 23, 1904.

which has often been interpreted to mean 'cut arms' or 'cut fingers' — being made by drawing the right index finger several times rapidly across the left — but which appears really to indicate 'striped arrows,' by which name they are known to the Hidatsa, Shoshoni, Comanche, Caddo, and probably other tribes, in allusion to an asserted old-time preference for turkey feathers for arrows. According to Henry, in 1806, the Missouri river tribes were accustomed to get from the Cheyenne "great numbers" of turkey-cock tails, for use as fans.[1]

EARLY HABITAT AND MIGRATION

The earliest authenticated habitat of the Cheyenne, before the year 1700, seems to have been along the middle course of Minnesota river in what is now southeastern Minnesota. Williamson, from Sioux tradition,[2] locates it definitely between the Blue Earth tributary and Lac Qui Parle, while Captain Clark,[3] from Cheyenne testimony more than twenty years ago, locates it in practically the same place. According to the national tradition of the Cheyenne, still preserved in the tribe, they had arrived there after long and devious wandering through a cold and desolate country farther to the north or northeast — in all probability eastern Canada. The Sioux, living at that period more immediately on the Mississippi, to the east and southeast, came in contact with the French as early as 1656, but the Cheyenne are first mentioned in 1680, under the name of *Chaa*, when a party of that tribe, described as living on the head of the great river, i. e., the Mississippi, visited La Salle's fort, Crèvecœur, on the Illinois, to invite the French to come to their country, which they represented as abounding in beaver and other fur animals.[4] The veteran Sioux missionary, Williamson, says that according to current and reliable Sioux tradition the Cheyenne preceded the Sioux in the occupancy of the upper Mississippi region, and were found by them already established on the Minnesota. At

[1] Coues, *Henry and Thompson Journals*, I, 355, 1897.

[2] Who Were the First Men? *Minn. Hist. Soc. Coll.*, I, 300, 1872.

[3] *Indian Sign Language*, 99, 1885.

[4] La Salle, letter, 1680, in Margry, *Découvertes*, II, 54, 1877. La Salle's fort Crèvecœur, was a short distance below the present Peoria, Illinois.

the same time the Iowa occupied the lower Minnesota, below the Cheyenne; the Oto were on its upper branches south and west of the Cheyenne, while the great body of the Sioux were still east of the Mississippi, about Mille Lac and northeastward toward Lake Superior. At a later period the Cheyenne moved over to the Cheyenne branch of Red river, North Dakota, which thus acquired its name, being known to the Sioux as "The place where the Cheyenne planted,"[1] showing that the latter were still an agricultural people.[2]

The prime cause of the upheaval and westerly migration of tribes about this period appears to have been the increasing pressure from the Cree and other tribes of the northeast after the establishment of the English trading posts on Hudson bay, beginning in 1668. Two years later, in 1670, the Hudson's Bay Company was organized, and within a few years had a chain of five posts stretching along the shores of the bay from Rupert river to Nelson river in the far Northwest, all within the territory of the Cree (then, as now, the largest tribe in Canada), or of bands in close kinship and alliance with them. At the same time the French traders were advancing their posts westward along the lakes and northward to the heads of the Mississippi, the principal trade staples being guns, ammunition, knives, and hatchets, in return for skins. Each party encouraged its Indian allies to destroy or drive from the country with the weapons thus furnished the tribes attached to the rival interest. Petty raiding was superseded by intertribal warfare upon a large scale, in which the advantage rested with the Cree and their allies by virtue of their greater number and the superior organization and wealth of the English company. The Assiniboin, the most exposed band of Sioux, were compelled some time before 1679 to ally themselves with the invading Cree to save themselves from destruction, thus incurring the lasting hatred of their kinsmen. Thenceforth Cree and Assiniboin joined forces to drive the Sioux toward the Missouri. Nor was the French influence strong enough to protect the Sioux from the attacks of their hereditary

[1] *Shai-e-na-wojupi* (Williamson); *Sha-he-e-la-wo-zu* (Hayden).

[2] Williamson, op. cit., *Minn. Hist. Soc. Coll.*, I, 1872

enemies, the Ojibwa of the lakes, who were already well supplied with guns from the French. In consequence, therefore, of this two-fold invasion from the east and northeast, we find the Sioux and other tribes of the vicinity being pressed onward to the Missouri river before the close of the eighteenth century. In this migration the Cheyenne probably led the van, being most remote from the traders of either nation, and therefore least provided of all with guns. When Le Sueur built his trading post on the lower Minnesota, near the present Mankato, in 1700, he was told that the river belonged to the Western Sioux (Teton), the Iowa, and the Oto. As no mention is made of the Chaa (Cheyenne), it is probable that they had already moved off toward the west since their visit to La Salle in 1680. The Iowa and Oto removed to the vicinity of the Omaha on the Missouri river just at the time that Le Sueur was building his fort.[1]

Whether the first migration of the Cheyenne from the Minnesota river into the prairie was due most to Sioux, Assiniboin, or Cree, it is impossible to say with certainty, as we have no documentary record of the event, and their own tradition simply represents the move as a voluntary exodus in search of new hunting grounds.[2] The later removals from the Cheyenne branch of Red river to the Missouri and thence to the Black hills were unquestionably due to the hostility of the Sioux.

The government explorers, Lewis and Clark, who held friendly communication with the Cheyenne on the upper Missouri in 1804 and again in 1806, distinctly state that the latter had at one time lived in a village and cultivated corn on the Cheyenne branch of Red river until driven out by the Sioux. They fled across the Missouri and built a fortified village, the ruins of which

[1] For detailed notice of trade establishments and rivalries, Indian negotiations and movements, in the upper Mississippi and Hudson bay region, from 1656 to 1700 and later, see Talon, Du Luc, Du Chesneau, De la Barre, and others in *N. Y. Col. Docs.*, IX, 1855; Ramsey, Neill, Williamson, Le Sueur, in *Minn. Hist. Soc. Coll.*, I, 1872; *Jes. Rels.* (Thwaites ed.), XXVIII, note, 320, 1898; Bryce, *Hist. Hudson's Bay Co.*, 1900; *Encycl. Americana*, VIII, 1903, article "Hudson's Bay Co."

[2] Their sacred tradition does indeed represent them as driven from the north by a stronger hostile tribe, but this evidently relates to a much earlier period.

were still visible in 1804, on the west bank of the river at a point identified from the description as a few miles north of the present Fort Yates, N. D. Here they had remained "a few years" until again driven out by the Sioux and compelled to take refuge in the Black hills, at the head of Cheyenne river of South Dakota, where they were then living on both sides of the mountains as roving buffalo hunters, without agriculture or fixed residence. They still carried on a defensive war with the Sioux, but were at peace with all their other Indian neighbors in that direction, although accustomed to make long journeys to the Spanish settlements in the Southwest to steal horses. They had formerly been at war with the Mandan, among whom the explorers found an adopted Cheyenne captive, and from some incidents of the narrative it appears that the peace was still somewhat doubtful.[2] No traders were yet resident among them, but they took their buffalo robes to the Arikara villages at the mouth of Grand river, on the Missouri, in the present South Dakota, where they met traders from the Hudson's Bay Company stations in the far north.

Bradbury in 1817 and Porter in 1829 both confirm the statement as to the Cheyenne having been driven from the Red river country by the Sioux, Porter fixing the event at about 1770.[2]

Clark, in his *Indian Sign Language*, already quoted, also says that they were driven west by the Sioux and perhaps also southward by the Mandan, and in another place states, on Cheyenne authority, that they were for many years at war particularly with the eastern Sioux, with intervals of peace terminated each time by some treachery of the latter tribe, until the final peace, interrupted only once since the Cheyenne had had guns.[3] He makes them cross the Missouri river "near the mouth of the

[1] Lewis and Clark, *Original Journals*, 8 vols., N. Y., 1904–05 : I, 176, 195, 212, 232 ; V, 352 ; VI, 100. The Mandan chief, Matotopa, visited by Maximilian in 1834 and by Catlin about the same period, had established his reputation by personal encounter with a Cheyenne chief.

[2] Bradbury, *Travels*, 124, 1817 ; Porter, *Rep. to Sec. War*, 1829, in Schoolcraft, Ind. Tribes, III, 595, 1853.

[3] Clark, *Indian Sign Language*, 99–101, 1885.

Cheyenne" and "about 200 or 250 years ago" — which is a fairly good guess. Culbertson, writing in 1850, says: "This nation once lived on the Missouri, but has been driven back gradually by the Sioux people until their principal range is west of the Black Hills."[1] Hayden, in 1860, says: "We have the testimony of persons now living in that country that the Dakotas drove them from the Missouri to their present position.[2] Surgeon A. J. Comfort, U. S. A., writing about 1870 concerning some ancient mounds on upper Minnesota river, also says: "The Cheyennes about one hundred years since, were dispossessed of the soil by the Dakotas . . . . The legend of the latter tribe ascribed to the former the authorship of the artificial tumuli in this vicinity."[3]

The Sioux calendars published by Mallery are full of notices of hostilities between Sioux and Cheyenne in the early period and continuing even up to 1840–41, when the final peace was made.[4]

Henry, on the other hand, writing in 1800, represents the Cheyenne as having been driven out by the Ojibwa ("Saulteurs"). According to his account they had lived on the upper course of the Cheyenne branch of Red river, on terms of close friendship with the Cree and Ojibwa, and maintaining a neutral attitude in the hereditary war between the latter tribes and the Sioux. Being at last suspected of having favored the Sioux, they were attacked about the year 1740 by a large war party of the Ojibwa, who destroyed their village, made great slaughter of the defenders, and forced the survivors to retire across the Missouri, where they had become a wandering tribe, but at the same time had increased in numbers. They were then (1800) generally on good terms with the Arapaho, Arikara, Mandan, and Teton Sioux. This statement gives us another date for

[1] Culbertson in *Fifth Report Smithsonian Institution*, 139, 1851.

[2] Hayden, *Indian Tribes of the Missouri Valley*, 275, 1862.

[3] Comfort in *Smithsonian Report for 1871*, 402, 1873.

[4] Mallery in *Fourth Report Bureau of Ethnology*, 1886. See also statement of Little Raven, in another place. In a recent verbal communication, Rev. John Eastman, of the Sioux tribe, also states that according to the tradition of his people they were formerly at war with the Cheyenne and had driven them across the Missouri.

their expulsion, which all other authorities attribute to the Sioux.[1]

The Cheyenne claim to have been well acquainted with the Sioux before crossing the Missouri, but deny having been driven out by them or by any other people, claiming rather that they moved west in search of better hunting grounds. They say that in the old home in Minnesota they lived in permanent villages of earth-covered log houses, like those of the Pawnee and Omaha, but that before crossing the Missouri they had adopted the skin tipi, which they fastened down with heavy stones instead of with pegs. While occupying permanent villages they subsisted chiefly on corn of their own planting, and fish and ducks from the lakes. If they used wild rice, they seem to have forgotten it. They also made pottery — an art which they retained in some measure until perhaps seventy years ago. At least one man still understands the making of beads and figurines from pounded glass, as formerly practised by the Mandan. They claim that their corn was at last "stolen" from them by the Arikara; which probably means that after they became wanderers they were forced to discontinue agriculture and depend on purchase from the sedentary tribes. The skin tipi was probably for some time used in conjunction with the more permanent log structure, which, as we shall see later, was not finally abandoned until about the year 1800.

TRADITIONARY TRIBES AND ALLIANCES

In the old home they had for neighbors and friends toward the northeast a cognate people, the *Móiseo* (sing., *Móis*), whose dialect was near to that of the *Sŭtaio*, but who also spoke Sioux from long association with that tribe. When the Cheyenne first moved out into the open country, the *Móiseo* accompanied them, but soon turned back, saying that they were hungry for the ducks of the lakes, and that the ghosts of the slain buffalo came to them in dreams at night and stared at them with great eyes, so that they were afraid to kill any more. Certain of the

[1] Henry (1800) in *Manuscript Journals of Alexander Henry and David Thompson*, Coues ed., I, 144, 383, 1897.

Cheyenne claim descent from this ancient tribe.[1] Attempts have been made to interpret this name as a Cheyenne word meaning 'many flies,' from *hïs*, 'a fly'; or 'flint people,' from *moïso*, 'flint.' Evidence shows, however, that it is merely an adaptation of a foreign name, and that the Móïseo are identical with the Monsoni, Monsona, or Mousoni, a tribe linguistically about equally akin to both Ojibwa and Cree, and occupying in 1740–90 the territory south and north of Rainy lake and Lake of the Woods, and ranging eastward to Moose river, in Canada.[2] We thus find the Cheyenne in early alliance with the tribes of Lake Superior.

Westward or southwestward from the Cheyenne in this early period, probably in the prairies about the upper James river, S. D., was another cognate tribe about which more is known, the *Sŭtaio* (singular, *Sŭ'tai*). According to practically unanimous tribal tradition, they spoke a "Cheyenne language," i. e., a dialect fairly intelligible to the Cheyenne — which agrees with the result of Mr Petter's philologic research, and probably accounts for their complete absorption later. As the story goes, the two tribes were for a long time at war, until, recognizing their kinship through a common language, they made peace and alliance, and finally crossed the Missouri together. The crossing was made in winter while the river was frozen over, and, the ice breaking — a common incident in migration traditions — a part of the Sŭtaio were forced to remain behind and became incorporated with the Móïseo. Living farther to the west, the Sŭtaio appear to have been a buffalo tribe, as distinguished from the Cheyenne and Móïseo, and it was from them, after the alliance had been made, that the Cheyenne obtained the ritual and ceremony of the Sun Dance, now the greatest of all their ceremonies. To the Sŭtaio belonged also the buffalo-cap medicine, with its sacred ritual and tradition, still preserved in the Sŭtaio

[1] Two authorities, Mad Wolf (born 1829) and Wolf Robe (born 1840) make the Móïseo a distinct band, occupying the southeast part of the circle. I have followed Lone Wolf, a principal priest (born 1838), Big Jake (born 1834), and others.

[2] See Jesuit Relation for 1672; Mémoire en abrégé, *ca.* 1749, in Margry, *Découvertes*, VI, 616, 1886; Dobbs, *Hudson's Bay*, 13, 1744.

band and regarded with a reverence second only to that accorded the sacred arrows. Some of the old people of the present Sŭtaio band claim that their extinction as a separate tribe is a punishment for having once abandoned the priest of the sacred buffalo-cap in his old age and decrepitude. In consequence of a dispute at the beginning of the outbreak in 1874, a part of this buffalo-cap medicine is now held among the Northern Cheyenne, while the rest is with the priest of the tradition among the Southern Cheyenne.

The Sutaio seem to be identical with the "Sta-e-tan" (i. e., *Sŭtai-itä'n* "Sutai man"), of Lewis and Clark (1806), described as a small tribe of 100 men and 400 souls, roving with several other tribes about the upper Platte, and having the same alliances and enemies as the Cheyenne.[1] Up to 1833, and probably until reduced by the cholera of 1849, the Sutaio retained their distinctive dialect, dress, and ceremonies, and usually camped apart from the Cheyenne. In 1851 they were still to some extent a distinct people, but exist now only as one of the component divisions of the (Southern) Cheyenne tribe, in no respect different from the others.[2]

Sage, who met the Cheyenne on the South Platte in 1843, thus notes this tradition of the Sutaio, whom, however, he confounds with the Grosventres:

> The tribe is composed of two divisions, viz.: the Cheyennes and Gros Ventres, — both speaking the same language and practicing the same designation of nationality, shown in sundry transverse scars upon the left arm. Neither of these divisions know their origin, but tell the following curious story of their first intercourse with each other. Many years since, the Cheyennes, while traveling from a north country, discovered the Gros Ventres, who were also upon a journey. As usual among strange tribes, both parties rushed to the attack, and a bloody battle would undoubtedly have been the result, had it not been stayed by the mutual discovery of

[1] *Lewis and Clark Journals*, Thwaites ed., VI, 101–102 1905.

[2] The statement that the Sutaio were a detached band of the Blackfeet (Grinnell, in *Am. Anthropologist*, April, 1892), or the more recent statement by the same author (*Proc. Congress of Americanists* for 1902, 1905) that they were a part of the Cree and joined the Cheyenne after the latter reached the Black hills, is not borne out either by preponderant tradition or by linguistic evidence. Lone Wolf, Cheyenne chief, born in 1838, says they formed a part of the Cheyenne circle when he was a boy.

an identity of language. Upon this, hostility at once gave place to friendship, and the two parties negotiated an immediate union. Since then they have been considered as one nation. What is most singular in this occurrence, neither the Gros Ventres nor Cheyenne could trace any previous connection or intercourse with each other, or knowledge of their individual existence.[1]

Another traditionary tribe encountered by the Cheyenne after crossing the Missouri was the Ówŭ'qeo (singular, Owŭ'q), the name being now without meaning. They seem to have lived in tipis, at least at times, and may have been of Siouan stock. They resided on the west bank of the river, probably near where the traditional crossing was made. They were hostile to the Cheyenne, who finally organized a winter expedition against them, at a time when the river was frozen over. Surprising them in their tipis before daylight, the Cheyenne drove them in upon the ice without giving them time to dress or arm themselves. The ice peeled the skin from their bare feet, and being thus unable either to stand or flee, the Ówŭ'qeo were massacred, men, women, and children, with the exception of one woman, who was claimed as a captive by a Cheyenne chief. Some informants think a few may have escaped, but as a tribe they were never reunited. The woman became the wife of her captor, and, after learning the Cheyenne language, informed him that her own husband had been a chief, and that in her tribe the government was held in a council of forty-four chiefs, selected according to certain forms for their bravery, wisdom, and fine physical appearance. The method, as she explained it, seemed good to the Cheyenne, and under her instruction they set up a "chief tipi," trimmed and painted a bundle of "chief sticks," and elected their first council of forty-four chiefs, on the plan which still continues in the tribe. There is a possibility that they were identical with the Awaqawi, Ahwahhaway, or Amahami, a remnant Siouan tribe found incorporated with the Hidatsa in 1804, but long since absorbed. If we accept this tradition as founded on truth, in connection with Henry's statement as to the time when the Cheyenne fled from the Red river

[1] Sage, *Scenes in the Rocky Mountains*, 159–160, 1846.

country, we may get 1750 as the approximate date of the adoption of their present council system.

For as long a period as the Cheyenne have been generally known to the whites, they have been in close alliance and association with the Arápaho, to such an extent that the phrase "Cheyenne and Arapaho" has become as familiar as that other compound tribal designation, "Sauk and Fox." Both languages are Algonquian and therefore cognate, although too far apart to be mutually intelligible. In habit, dress, and much of their ceremony the tribes are also closely identical, but keep separate camp circles and sun dances. Cheyenne tradition is silent as to when this association or alliance began, from which some of the old men argue that it must be of more recent date than the events recorded in the migration story and subsequent to the crossing of the Missouri, although dating back more than a century. Others claim that they knew the Arapaho before the alliance with the Sutaio. Clark, in his *Indian Sign Language*, says that "very reliable tradition locates this tribe in western Minnesota several hundred years ago, meeting the Cheyennes as they — the Cheyennes — came out on the prairie, and for many years moving and camping with or near them, so that for all practical purposes they were one people" until after passing the Black hills, when their lines began to diverge. This statement is probably near the truth, and agrees very well with the statement of Mackenzie that, about the period of 1790, the Arapaho occupied the plains from the north bend of the Missouri across to the south bend of the Assiniboin, i. e., east of the Missouri in what is now eastern North Dakota and the adjacent part of Manitoba, and seemed to be slowly moving toward the northwest.[1] Little Raven, principal chief of the tribe, told Clark, about 1884: "When my father was a child we were at war with the Sioux. Twenty-nine years since he died, and he had seen sixty winters at his death. We afterwards made peace with the Sioux, and sometimes lived with them. The Cheyennes

[1] Mackenzie, *Voyages*, lxxi, 1801. He does not mention them by name, but describes them as the people from whom have come the Fall Indians or Atsina.

made peace first. The Sioux first saw white men, then the Cheyennes."[1]

CONTACT WITH EARLY TRAVELERS

From 1680 to 1800 the only reference to the Cheyenne seems to be that of Carver, who incorrectly makes the "Schians" and "Schianese" two distinct bands of Sioux in 1768.[2] There is no evidence that any one of the tribes met by Verendrye in 1742–43, in his journey from the Mandan country southwest to the Rocky mountains and back again, was identical with the Cheyenne, who were probably at that time still on the Cheyenne branch of Red river.[3]

In his journal for 1800, the younger Alexander Henry, a trader of the Winnipeg region, describes the Cheyenne as having been driven from the Red river country and being then a wandering tribe west of the Missouri, on terms of general friendship with the Arapaho, Arikara, Mandan, and Teton Sioux.[4]

In 1802 the French traveler, Perrin du Lac, met at the mouth of White river, on the Missouri, a party of Cheyenne, many of whom had never before seen a white man and who manifested a childish delight at the small trinkets which he distributed to them. Further on he states that their principal range was then on both sides of the Cheyenne river of South Dakota, and that, although most of their time was spent chasing the buffalo, they yet planted corn and tobacco in the vicinity of their village, which they gathered on their return from the summer hunt. This permanent village was probably about the junction of the Cheyenne with the Missouri, and it is evident from his statement that the tribe was still in some measure

[1] Clark, *Indian Sign Language*, 39–40, 1885. The Arapaho are the Canenavich or Kaninavish of Lewis and Clark, and the Gens de Vache of Henry and the early Canadian traders.

[2] Carver, *Travels*, 50, 1796.

[3] He mentions Assiniboëls, Mantanes, Gens des Chevaux, Beaux Hommes, Petits Renards, Pioya, Gens de l'Arc, Gens du Serpent, Gens de la Belle Rivière, Gens de la Petite Cerise, and Gens de la Flèche Collée, autrement Sioux des Prairies. The majority of these names seem to occur in no other writing. See Margry, *Découvertes*, VI, 598–611, 1886.

[4] *Henry and Thompson Journals*, Coues ed., I, 144, 1897.

sedentary and agricultural. They probably gave up the agricultural habit on finally abandoning this village. They were on friendly terms with the Arapaho, Kiowa, and "Tokiouakos" (?),[1] roving tribes hunting in the same region. Perrin du Lac has something to say of their mourning customs and gives an interesting myth of a sacred lake where dwelt the king of the beavers. He makes three subtribes, the Chaguyenne, Ouisy, and Chousa, which Petter, on careful analysis, identifies respectively as the Hevhaitäneo or main body of the tribe, the O'misis, and the Hotamitäneo.[2]

The explorers, Lewis and Clark, were visited by several of the tribe while among the Mandan about Knife river, N. D., in 1804, and again held more extended communication with them among the Arikara about the mouth of Grand river, S. D., on their return trip in 1806. The description which they give is of special interest for its early date:[3]

> The Chyennes are portly Indians, much the complexions of the Mandans and Ricaras — high cheeks, straight limbed, and high noses. The men are large. Their dress in summer is simply a robe of a light buffalo skin with or without the hair, and a breech clout and moccasin. Some wear leggins and moccasins. Their ornaments are but few, and those are composed principally of such articles as they procure from other Indians, such as blue beads, shell, red paint, rings of brass, brooches, etc. They also wear bear's claws about their necks, strips of otter skin (which they, as well as the Ricaras, are excessively fond of) around their necks, falling back behind. Their ears are cut at the lower part, but few of them wore ornaments in them. Their hair is generally cut in the forehead above their eyes, and small ornamented plaits in front of each shoulder; the remainder of the hair is either twisted in with horse or buffalo hair divided into two plaits, or, what is most common, flows back. Their women are homely, coarse-featured, wide mouths. They wear simply a leather habit made in a plain form, of two pieces of equal length and equal width, which is sewn together with sinews from the tail to about half way from the hip to the arm; a string fastens the two pieces together over the shoulders, leaving a flap or lapels which fall over near

[1] "To-che-wah-coo" or "Fox Indians," mentioned as one of the tribes bringing robes and horses to trade with the Arikara.—*Lewis and Clark Journals*, Thwaites ed., I, 190, 1904.

[2] Perrin du Lac, *Voyage dans les Deux Louisianes*, 213, 218, 257–262, 275, 1805.

[3] *Lewis and Clark Journals*, Aug. 22, 1806, V, 356–57, 1905. We reduce the peculiar spelling and punctuation of the original to the accepted form.

half way down their body both before and behind. Those dresses usually fall as low as mid leg ; they are frequently ornamented with beads and shells and elk tusks, of which all Indians are very fond of [sic]. Those dresses are also frequently printed in various regular figures with hot sticks, which are rubbed on the leather with such velocity as to nearly burn it. This is very handsome. They wear their hair flowing, and are excessively fond of ornamenting their ears with blue beads. This nation is peaceably disposed. They may be estimated at from 350 to 400 men inhabiting from 130 to 150 lodges [about 300 lodges," I, 176]. They are rich in horses and dogs. The dogs carry a large proportion of their light baggage. They confess to be at war with no nation except the Sioux, with whom they have ever since their remembrance been on a defensive war, with the [eastern ?] bands of Sioux. As I was about to leave the chief's lodge, he requested me to send some traders to them ; that their country was full of beaver and they then would be encouraged to kill beaver, but now they had no use for them, as they could get nothing for their skins and did not know well how to catch beaver. If the white people would come amongst them they would become acquainted and they [i. e., the white people] would learn them how to take the beaver. I promised the nation that I would inform their great father, the President of the United States, and he would have them supplied with goods, and mentioned in what manner they would be supplied, etc., etc.

Henry, the trader already quoted, visited the Cheyenne again in 1806 in their main camp while they were moving in to make a treaty of alliance with the Hidatsa and Mandan, which was to be formally ratified by the ceremonial adoption of a young Cheyenne by the Hidatsa chief. The ceremonies, however, came to an abrupt and violent close in consequence of the arrival of a small party of Assiniboin, hereditary enemies of the Cheyenne, the latter attempting to kill them, but being prevented by the others. Henry describes the Cheyenne as superior to the Missouri river tribes in manners and appearance and in the dressing and ornamentation of skins and robes. They traded white buffalo robes, turkey tails, and beaver skins to the river tribes for corn, beans, and some few guns, and even had some dealings with tribes from the Illinois country. They generally wintered southward from the Black hills and moved northward to the Missouri in the spring. His description of the adoption ceremony is very interesting,[1] and in hinting at a linguistic

[1] *Henry and Thompson Journals*, Coues ed., I, 347–97, 1897.

connection with the Cree he gives us the earliest clew to an Algonquian affinity.

In the summer of 1811 the overland expedition under command of W. P. Hunt, bound from St Louis for Astoria at the mouth of the Columbia, made a two weeks' stop among the Cheyenne for the purpose of buying horses. They were then camped about the eastern base of the Black hills and in friendly trade relations with the Arikara.[1]

FIRST TREATY — REMOVAL TO THE ARKANSAS

Constantly pressed farther into the plains by the Sioux in their rear, the Cheyenne established themselves next on the upper branches of the Platte, driving the Kiowa in their turn farther to the south. They made their first treaty with the Government in 1825, at the mouth of Teton (Bad) river, on the Missouri, about the present Pierre, S. D. General Atkinson, in charge of the treaty expedition, describes them as having been driven by the Sioux from the Red river country, and then roving about the Cheyenne river from near its mouth back to the Black hills. In general habit they resembled the Sioux. They had had but little acquaintance as yet with traders, and generally used the bow, but had a number of guns and an abundance of horses and mules. They were very friendly to the whites. He estimated them at 3,000 souls.[2]

In 1828 the Bent brothers and Ceran St Vrain established a small trading post at the present Pueblo, Colorado, in consequence of which a part of the Cheyenne, who had already met William Bent as a trader at the mouth of the Yellowstone, determined to move down to the Arkansas river. The tribe at that time camped chiefly in the western Black hills, Wyoming, but frequently raided to the southward against the Kiowa and others. The Hévhaitäneo band led the van of the migration, but was obliged to turn back on account of an outbreak of smallpox at the post. A few years later Bent's Fort was built on the Arkansas river, in southeastern Colorado, and this time, on the

[1] Irving, *Astoria*, I, 303, 323–29, 1897.

[2] Atkinson, *Report on Treaty Expedition*, 10, 1826.

personal invitation of William Bent himself, who went up to urge the matter, the main body of the tribe removed permanently to the upper Arkansas, arriving in the vicinity of the fort just before the noted star shower in the fall of 1833. The rest of the tribe continued to rove about the headwaters of the North Platte and Yellowstone. The separation was made permanent by the treaty of Fort Laramie in 1851, the two sections being now known respectively as Southern and Northern Cheyenne, but the distinction is purely geographic, although it has served to hasten the destruction of their former compact tribal organization. The Southern Cheyenne are known in the tribe as Sówoníă, 'southerners,' or sometimes, loosely, Hévhaitä'neo, while the Northern Cheyenne are commonly designated as O'mĭ'sĭs, 'eaters,' from the division most numerously represented among them.

The first incidental notice of the Cheyenne in the annual Reports of the Commissioner of Indian Affairs occurs in 1835, but they are not prominently mentioned until some years later. In 1838 it is reported that they had abandoned the Sioux country several years ago and were then generally to be found on the Arkansas.[1]

Their advent on the Arkansas brought them into constant collision with the Kiowa, who, with the Comanche, claimed the territory to the south. The old men of both tribes tell of numerous encounters during the next few years, chief among these being a battle in 1837, in which the Kiowa massacred an entire party of 40 Cheyenne warriors of the Hĭ'matanóhĭs (Bowstring) society after a stout defense.[2] In retaliation the Cheyenne and Arapaho the following summer attacked the Kiowa and Comanche, on Wolf creek, in northwestern Oklahoma, with considerable loss on both sides. About 1840 the Cheyenne made peace with the Kiowa, who themselves made peace with the Sioux about the same time, since when all these tribes, together with the Arapaho,

[1] Pilcher in *Rep. Com'r. Ind. Aff. for 1838*, 471.

[2] The encounter took place on the head of a small southern tributary of the Washita, on the Red River divide, about 12 miles southwest of the present Cheyenne, Oklahoma. The date is fixed from the author's Kiowa Calendar. See *Sevententh Report Bureau of American Ethnology*, 1898.

Comanche, and Kiowa Apache, have usually acted as allies in the wars with other tribes with the whites. For a long time the Cheyenne have mingled much with the western Sioux, from whom they have patterned in many details of dress and ceremony. They seem not to have suffered greatly from the smallpox epidemic of 1837–39, having been warned in time to escape to the mountains, but in common with other prairie tribes they suffered terribly from the cholera in 1849, several of their bands being nearly exterminated. For some reason, possibly for this very cause, there is no official report from the Cheyenne for this year, and consequently no mention of this epidemic among them, although much is said of its terrible ravages among the Pawnee. Culbertson, writing a year later, states that the Cheyenne had lost about 200 lodges, estimated at 2,000 souls, or about two-thirds of their whole number before the epidemic.[1]

Their removal to the Arkansas also brought them into closer contact with exploring expeditions and the Santa Fé traders. Frémont, Abert, Sage, and more particularly Garrard, give interesting notes on the tribe as met in the neighborhood of Bent's Fort about this period. In 1846 it was officially reported that they were being plundered and demoralized by whisky dealers from New Mexico. In the same year their first resident agent was appointed in the person of Thomas Fitzpatrick, with headquarters at Bent's Fort.[2] At a later period the agency was organized as the agency of the Upper Arkansas, with jurisdiction over the Cheyenne and Arapaho of the south, together with the Comanche, Kiowa, and Kiowa Apache. The Northern Cheyenne and Arapaho, together with the Oglala and Brulé Sioux, were placed in charge of the agency of the Upper Platte, with headquarters nine miles east of Fort Laramie, Wyoming. From the missionary, De Smet, we have account of a friendly visit with the Cheyenne of the North Platte in 1840.

FORT LARAMIE TREATY — FIRST CHEYENNE WAR

In 1846 began a flood of emigration across the plains to

[1] Culbertson in *Smithsonian Report for 1850*, p. 139 et seq.

[2] Agent Moore in *Rep. Com'r. Ind. Aff. for 1846*, 293–96; Agent Fitzpatrick in *Rep. Com'r. Ind. Aff. for 1847*, 238–49.

Oregon and Washington, and three years later this was swelled to tidal proportions by the discovery of gold in California. The principal overland trail reached the mountains by ascending the North Platte, and to insure the safety of the emigrants and to arrange an understanding among the various warring tribes, the treaty of Fort Laramie was negotiated in September, 1851. At this great gathering probably ten thousand Indians were assembled — Sioux, Assiniboin, Crow, Mandan, Arikara, Hidatsa, Cheyenne, Arapaho — half of them hereditary enemies to the other half from time beyond memory. The treaty carried annuity stipulations, recognized the right of the government to establish roads and military posts in the Indian territory, fixed tribal boundaries, and declared an end of tribal wars. The Cheyenne and Arapaho were recognized as owners of the country between the North Platte and the Arkansas (construed to mean its southern branch, the Purgatoire) from their sources in the Rocky mountains down to a line running southward from about the forks of the Platte. This territory embraced large sections in Wyoming, Nebraska, and western Kansas, with about half of the present Colorado, including the sites of Denver, Leadville, and Pueblo. It was to maintain this territory that the Cheyenne fought their subsequent wars.[1]

Their peace with the Kiowa had enabled them to extend their incursions farther to the south, and in 1853 they made their first raid into Mexico, but with disastrous result, losing all but three men in a fight with Mexican lancers.

Up to this time the Cheyenne as a tribe had remained at peace with the whites, notwithstanding several unfortunate happenings in their intercourse with emigrants, troops, or traders on the two main travel routes, the Santa Fé trail along the Arkansas, and the Oregon trail along the North Platte. Another disquieting element was furnished by the advent of the immigrant tribes which had been recently removed from the Eastern states and settled upon the frontiers of Kansas. With

[1] See Treaty of Fort Laramie, 1851; Keppler in *Ind. Affairs: Laws and Treaties*, II, 594, 1904; also discussion of same treaty, with maps, in Royce, Indian Land Cessions, *Eighteenth Rep. Bur. Am. Ethnol.*, 1899.

their hunting instinct and improved firearms they vied with the white immigrants in the wholesale slaughter of the buffalo, on which the Plains tribes depended. In 1854 the latter organized their forces in a great expedition of some 1,500 warriors — Sioux, Comanche, Kiowa, Cheyenne, Arapaho, and others — with the purpose of sweeping the immigrant tribes from the plains, but were completely routed by a handful of the eastern warriors, who fought with rifles, while their assailants had only bows.[1] Two years before it had been officially reported that the Plains Indians were suffering from the vast number of emigrants passing through their country, destroying their means of support and scattering disease and death among them.[2]

The first serious trouble occurred among the Northern Cheyenne, who were the greatest sufferers. In April, 1856, the commanding officer at Upper Platte bridge (now Casper, Wyoming) summoned the Indians of a neighboring camp to surrender four horses claimed by emigrants. Three horses were promptly given up, but a dispute arose as to the fourth, when the officer attempted to put the Indian claimants under arrest, upon which they resisted and one was killed. The entire camp then fled into the Black hills, leaving their tipis and belongings to be seized by the troops, and killing a trader whom they met in their flight, which they continued until they effected a junction with the southern band on Republican river in Kansas.[3] While in this neighborhood, in August of the same year, a war party looking for Pawnee met the mail coach. Two young men approached it, as they said, to beg for tobacco, but being mistaken for enemies, were fired upon and one of them wounded by the driver. They retaliated by sending an arrow through his arm, when the chiefs interposed by shielding the driver until out of danger and punishing the two warriors. When the affair was reported at Fort Kearney (Nebraska), troops were sent out, who fired upon the Indians at close range, killing six. Instead

[1] Reports of Agents Whitfield and James and Superintendent Cumming in *Rep. Com'r. Ind. Aff. for 1854;* Mooney, Calendar Hist. Kiowa Inds., *Seventeenth Rep. Bur. Am. Ethnol.*, II, 297–99, 1898.

[2] Commissioner Lea, *Rep. Com'r. Ind. Aff. for 1852*, 9.

[3] Agent T. S. Twiss in *Rep. Com'r. Ind. Aff. for 1856*, 87, 1857.

of returning the fire, the Cheyenne again abandoned their camp with everything in it and fled north across the Platte, killing two men, a woman, and a child of an emigrant party which they met on the way. Within a few days thereafter small raiding parties from the main band killed eight other whites, and took a woman and a child captive. Although the agent in charge protested most strongly that both affairs were due to misunderstanding and that he could adjust all differences without assistance, it was decided that the situation demanded forcible measures, and the first Cheyenne war was inaugurated.[1] For a full year the whole Kansas frontier was made desolate by a series of Indian raids in which property was destroyed, lives lost, and captives carried off to be subjected to every savage cruelty.[2] The campaign was brought to a head by Colonel E. V. Sumner, who, on July 29, 1857, struck the main body of warriors, on Solomon river, completely routing them in spite of a bold stand, two days later entering and destroying their abandoned village, together with all their winter provisions, and pursuing them to the Arkansas, where they and the Kiowa had been threatening Bent's Fort. It is said that the exceptionally bold front assumed by the Indians in the beginning of the action was due to the encouragement of their medicine-man, who had assured them that by certain preliminary mystic ceremonies he had rendered them immune from the bullets of the soldiers. Unfortunately for the prediction, the troops charged with sabers.[3]

[1] Reports of Thomas S. Twiss, agent of the Upper Platte agency, in *Rep. Com'r. Ind. Aff. for 1856*, 87–103, 1857.

[2] Says Agent Miller (*Rep. for 1857*, p. 146): "Various reports came to my ears of the treatment of the prisoners they had taken during the summer, the details of which are too disgusting and horrible for repetition here. Suffice it to say, that they were the most terrible that can be possible for even Indian iniquity in inventing modes of cruelty to conceive." Every one who knows the history of Indian warfare knows this to be true, and it is just this invariable accompaniment of devilish and bestial cruelty which often compels the friends of the Indian to be silent even when they know that the original justice of the quarrel is on his side. The Cheyenne answer to the argument is the Chivington massacre.

[3] Reports of Col. E. V. Sumner, R. J. Walker, Maj. L. A. Armistead, and Lieut. Lewis Merrill, in *Trans. Kansas State Hist. Soc.*, v, 299–301, 370–3, 1896; Com'r. J. W. Denver and Agt. R. C. Miller in *Rep. Com'r. Ind. Aff. for 1857*, 9, 141–8, 1858. The Indians were led by Shave Head of the Southern Cheyenne,

In his next annual report the agent for the Upper Arkansas stated that the Cheyenne were anxious to be at peace and to have an undisturbed reservation assigned them, with tools for learning farming in anticipation of the failure of the buffalo.[1]

GOLD RUSH TO COLORADO — FORT WISE TREATY

In the very next year, however (1858), gold was discovered at Pike's peak in Colorado. At once began a great rush to the mines, the town of Denver was laid out and a county government organized, all within the treaty limits of the Cheyenne and Arapaho. In his report for 1859 the Indian Commissioner calls attention to the gravity of this new issue, as affecting all the tribes of the upper Arkansas, and says: "A crisis has now, however, arrived in our relations with them. Since the discovery of gold in the vicinity of Pike's Peak the emigration has immensely increased; the Indians have been driven from their local haunts and hunting grounds, and the game so far killed off or dispersed, that it is now impossible for the Indians to obtain the necessary subsistence from that source. In fact, we have substantially taken possession of the country and deprived them of their accustomed means of support."[2]

In the same report Colonel William Bent of Bent's Fort, at that time agent for the Upper Arkansas tribes, gives urgent warning of the necessity of making immediate provision for settling these Indians upon reservations under guaranteed security from lawless intrusion, together with payment for the lands already occupied by the whites. His suggestions were based on more than thirty years of intimate knowledge of the Plains Indians, particularly the Cheyenne.[3]

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afterward killed by jumping from a train while a prisoner en route to Florida, and by Ice, alias White Bull, of the Northern Cheyenne, still living in 1903.

[1] Agt. R. C. Miller in *Rep. Com'r. Ind. Aff. for 1858*, 98–99.

[2] Com'r. A. B. Greenwood, *Rep. Com'r. Ind. Aff. for 1859*, 21, 1860.

[3] The Bent brothers, with St Vrain, the Campbells, and the Chouteaus, were associated in the Indian trade on the upper Arkansas and Platte. Charles and William Bent built Bent's Fort, Colorado, in 1832. Charles Bent, first American governor of New Mexico, was murdered at Taos in 1847. Two other of the Bent brothers died, and under these discouragements the fort was blown up by William Bent in 1849. In 1853 he built a new fort lower down on the Arkansas, which was soon

He states that while the confederated Cheyenne and Arapaho scrupulously maintained peaceful relations with the whites notwithstanding the irritation growing out of the occupancy of the gold fields and the consequent emigration through their hunting grounds, estimated by him at more than 60,000 emigrants in a single season, yet a grave crisis was at hand involving all the tribes of his jurisdiction. "A smothered passion for revenge agitates these Indians, perpetually fomented by the failure of food, the encircling encroachments of the white population, and the exasperating sense of decay and impending extinction with which they are surrounded. . . . These numerous and warlike Indians, pressed upon all around by the Texans, by the settlers of the gold region, by the advancing people of Kansas, and from the Platte, are already compressed into a small circle of territory, destitute of food, and itself bisected athwart by a constantly marching line of emigrants. A desperate war of starvation and extinction is therefore imminent and inevitable, unless prompt measures shall prevent it." [1]

In February, 1861, a treaty was negotiated at Fort Wise, Colorado,[2] with the representatives of the Southern Cheyenne and Arapaho, for a reservation on the Arkansas river, in Colorado, with provision for annuities and assistance toward agriculture and civilization. It failed of effect from the refusal of the northern band, on the Platte, to remove from their accustomed hunting grounds.[3] In the meantime the Civil War had broken out and the ferment had spread among the prairie tribes.

afterward bought by the Government and named Fort Wise, afterward Fort Lyon. William Bent died in 1869, aged about 65. He was given, or offered, a colonel's commission in the Mexican war, but did not accept. He was twice married in the Cheyenne tribe, with which he had probably more influence than has ever been held by any other white man.

[1] Agent Bent in *Rep. Com'r. Ind. Aff. for 1859*, 137–39, 1860.

[2] Originally "Bent's New Fort," afterward Fort Lyon. Described in the treaty as situated "in the territory of Kansas."

[3] See Kappler, *Ind. Affairs: Laws and Treaties*, II, 807, 1904; Royce, Indian Land Cessions, *Eighteenth Rep. Bur. Am. Ethnol.*, II, 824 and maps, 1899; Com'r. Dole in *Rep. Com'r. Ind. Aff. for 1862*, 33, 1863; and Rep. for 1863, 16, 1864. The treaty bears the names of but six Cheyenne signers, as against thirteen attached to that of 1825, and fourteen affixed to that of 1867, in which only the Southern Cheyenne were represented.

In 1862 smallpox ravaged the Platte country and some depredations were committed by the Sioux and the dissatisfied Northern Cheyenne.[1] In an effort to compel the Northern Cheyenne to accept the Fort Wise treaty and reservation they were notified that they must thenceforth go to the Southern agency for their annuity supplies. They remained obdurate, however, absolutely refusing to recognize the treaty, to surrender their hunting grounds on the heads of the Republican and Smoky Hill rivers, or to give up their free hunting life. Depredations occurred on the Arkansas as well as in the north, rumors became current of combinations of hostile tribes, and Governor Evans of Colorado got ready for trouble.[2] On the Indian side, their agent reported that most of the depredations committed by them were due to starvation, and that those who had come in upon the reservation, although apparently anxious to settle down, would find it impossible to remain unless something were done to support them, as there was not a buffalo within two hundred miles and but little game of any kind.[3]

OUTBREAK OF 1864 — CHIVINGTON — HANCOCK — MEDICINE LODGE TREATY

The frontier garrisons having been depleted for service in the Civil War, a volunteer force was organized in Colorado and placed under command of Colonel J. M. Chivington. In April, 1864, near Camp Sanborn on the South Platte, occurred the first collison between troops and Cheyenne Indians since 1857. Other engagements followed within the next few months, resulting in some killing on both sides and considerable losses to the Indians in tipis and horses. From the testimony it seems probable that these earlier difficulties could have been avoided or peaceably ad-

[1] Agent Loree in *Rep. Com'r. Ind. Aff. for 1862*, 131–32, 1863. Several thousand Indians of the civilized tribes in the Indian Territory were enrolled in the Confederate service, and the Confederate government negotiated treaties with the Comanche and other western tribes. To maintain their loyalty the Caddo were forced to take refuge with the Cheyenne and Arapaho in Colorado.

[2] Reports of Governor and Ind. Supt. John Evans and others in *Rep. Com'r. Ind. Aff. for 1863*, 121–32, 1864.

[3] Agent S. G. Colley, ibid., 134–35.

justed under other management.[1] Early in August a large body of Cheyenne, with some Sioux and Arapaho, made a destructive and bloody raid down the Platte, routing a considerable cavalry force west of Fort Kearney, Neb., destroying a wagon train, killing eleven men and capturing a woman and child, and then swept on down the valley of the Little Blue, in southeastern Nebraska, burning scattered farm houses, killing settlers, and carrying off other women and children.[2] Although the raid seems to have been the work of the northern hostiles, it intensified the feeling of hatred toward the whole Indian race, and Chivington, in a public speech, announced it as his policy to "kill and scalp all, big and little."[3] Four of the captives were afterward rescued and voluntarily delivered at Fort Lyon by the friendlies under Black Kettle, and others were surrendered by the hostiles the next year.

Through the efforts of Major Wynkoop, commanding at Fort Lyon, Colorado, and relying on his promise and that of Governor Evans that they should be protected and unmolested, a large part of the friendly element of the Cheyenne and Arapaho, under Black Kettle, White Antelope, and other signers of the Fort Wise treaty, had withdrawn from the main body about the head of Smoky Hill river and made their camp on Sand creek, some 25 miles northeast from Fort Lyon. They numbered about 500 souls, of whom more than two-thirds were women and children. While thus encamped under military orders and guaranty, with several white men trading among them by permission from the commandant of the post, and with a large United States flag and a smaller white flag displayed above the tipi of the principal chief, they were attacked at daybreak of November 29, 1864, by nearly a thousand mounted Colorado troops, with artillery, under command of Colonel Chivington, and about 150 men, women and children — all who were unable to escape — were there massacred under circumstances of atrocity never exceeded

[1] Downing, Bouser, Wynkoop, in *Condition Ind. Tribes*, 68–75, 1867.

[2] Palmer in *Trans. Nebr. Hist. Soc.*, II, 197–98, 1887; Governor Evans, pp. 80–90, and statement of Mrs Eubanks, captive, p. 90, in *Condition Ind. Tribes*, 1867.

[3] Affidavit of S. E. Browne, ibid., 71.

by the worst savages in America. Children were brained and hacked to pieces, pregnant women were ripped open, stiffened corpses of men, women, and little children the next day were scalped, dismembered, and indecently mutilated, and the bloody scalps and members, hung at saddle bows and hatbands, carried into Denver and there paraded in a public theater. All this under the eye and sanction of Colonel J. M. Chivington, ex-minister of the Gospel. More than one hundred tipis with all their stores were destroyed, and some 600 horses, with a large number of saddles and beaded buckskin dresses, were brought away and sold in Denver. The few warriors made a brave defense, although outnumbered nearly ten to one, and covered the retreat of their families up the creek until beyond pursuit. The attacking party lost 9 killed and 38 wounded.[1] The immediate result of this massacre was to destroy the confidence of those Indians who had hitherto been of friendly disposition and to exasperate the others to the highest pitch of hostility.[2] A war involving all the tribes swept the whole frontier, particularly along the Platte, whither most of the refugees had fled.

On January 7, 1865, some 500 Cheyenne, Arapaho, and Sioux attacked the military and stage station at Fort Sedgwick (Old Julesburg), Colorado, on the South Platte, capturing the stage with its valuable contents and killing the driver and 14 men of the small garrison, but with considerable loss to them-

[1] See the sworn testimony of civilian and military officers, traders, interpreters, and others in the special investigation of the Chivington massacre, *Condition of the Ind. Tribes: Rep. of the Joint Special Committee*, etc., 26–98, 1867. With the exception of Chivington and Shoup of the attacking party, and Governor Evans of Colorado, the witnesses are practically unanimous as to the friendly character of the murdered Cheyenne, the guaranties previously made to them, and the atrocities perpetrated. The list includes Major Wynkoop, Agent Colley, Colonel Bent, John Smith, Kit Carson, and others. See also Commissioner Cooley (p. 24), Agent Leavenworth (p. 387) and others in *Rept. Com'r. Ind. Aff. for 1865;* Bancroft, *Hist. of Nev., Col. and Wyo.*, 466, 1890; and Treaty of Little Arkansas, in *Indian Affairs: Laws and Treaties*, II, 889, 1904. The author has also additional details from Indian survivors of the massacre. The most of the deviltry seems to have been the work of the hundred-day volunteers under immediate command of Col. George L. Shoup. A few tipis of Arapaho were with the Cheyenne. The creek is more commonly known among the Indians by a name loosely translated "Dry creek."

[2] Com'r. Cooley, Agent Leavenworth, in *Rep. Com'r. Ind. Aff. for 1865.*

selves. About a month later they burned the town and cut the telegraph.[1] On February 13 there was a desperate encounter between troops and Indians at Rush creek, Nebraska, northward from Julesburg, and in April another as desperate at Mud springs in the same vicinity, the Indians in both cases being finally driven off with artillery, the troops being under command of Lieutenant-General Collins.[2] In August and September, General Conner led a strong force into the Powder river country of Wyoming and returned after a spirited engagement with the Arapaho, on Tongue river, near the present Sheridan, destroying their village and capturing more than a thousand horses.[3] During his absence a force of perhaps 600 Indians, chiefly Northern Cheyenne under High Wolf, invested the stockade protecting the emigrant crossing at Old Platte Bridge (now Casper), Wyoming, garrisoned at the time by about 100 men, and cut off all but one of a detachment of 27 cavalry approaching the fort, together with 35 others from the garrison who attempted their rescue. Thirteen of the latter were taken and tortured to death in plain view of their comrades within the stockade.[4]

By the persistent effort of Agent Leavenworth, in charge of the Kiowa and Comanche, seconded by Colonel Bent and Kit Carson, the southern tribes, including even the survivors of the Chivington massacre, were induced to come in October, 1865, to a council ground on the Little Arkansas river, near the present Wichita, Kansas, and there make a treaty of peace, with provision for a temporary reservation until a permanent home outside the limits of Kansas could be assigned them. The sixth article of the treaty repudiated and condemned in the strongest terms the Sand Creek massacre and promised repara-

[1] Palmer in *Trans. Nebraska Hist. Soc.*, II, 199, 1887. Bancroft, *Hist. Nev., Col. and Wyo.*, 715, 1890. Also personal Indian information.

[2] Bancroft, *Hist. Nev., Col. and Wyo.*, 715–16, 1890. There are at least five Rush creeks in western Nebraska. It was probably the one near Lapeer on the North Platte.

[3] Palmer in *Trans. Nebraska Hist. Soc.*, II, 197, passim, 1887.

[4] See Whitehead in *Wyoming Hist. Soc. Coll.*, I, 288–92, 1897. This account tallies very exactly with the author's information from Indian participants, who, however, carefully suppress all reference to tortures and mutilations

tion to the surviving sufferers.[1] The Sioux, with the Northern Cheyenne and Arapaho, continued hostilities. During the next year several conferences were held with various bands, both north and south, with a view to a restoration of peace by an adjustment of differences, the chief difficulty being with the Dog Soldier band of Cheyenne, who strenuously objected to the opening of the Smoky Hill country, on the ground that it was now their best hunting ground.[2] Negotiations were proceeding toward a successful termination when the whole peace fabric was once more brought to the ground by the ill-advised action of General Hancock, who, despite the most earnest protests of agents Wynkoop and Leavenworth, marched out from Fort Larned in April, 1867, and entirely destroyed a great village of Cheyenne and Sioux, on Pawnee fork, consisting of 300 tipis, with all their contents. At the very time of its destruction, Roman Nose and other chiefs, with a large part of the warriors, had come out to meet the troops, the women and children having stampeded in alarm, remembering the Sand Creek massacre.[3]

The result was an immediate renewal of active hostilities, continued until brought to a close by the efforts of an influential peace commission appointed by congress to treat with the various tribes. At a great gathering on Medicine Lodge creek, southern Kansas, treaties were concluded on October 21, 1867, with the Kiowa, Comanche, and Apache, and on October 28 with the Southern Cheyenne and Arapaho, by which they agreed to cease war and all opposition to road building on the Smoky Hill and the Platte, and to the establishment of military posts, and, in lieu of all other territorial claims, to accept reser-

[1] Treaty of Little Arkansas, *Ind. Affairs: Laws and Treaties*, II, 887–92, 1904; see also summary of land provisions, with maps, in Royce, Ind. Land Cessions, *Eighteenth Rep. Bur. Am. Ethnol.*, pt. 2, 1899.

[2] See reports of Captain Gordon and Com'r. Wynkoop in *Rep. Com'r. Ind. Aff. for 1866*, 277–79, et seq., 1866. It was proposed to build the Union Pacific railroad across this territory.

[3] See discussion of this affair by Supt. Murphy, Agent Wynkoop, and Agent Leavenworth, in *Rep. Com'r. Ind. Aff. for 1867*, 292, 309–14, 1868; also report of Peace Commission in *Rep. Com'r. Ind. Aff. for 1868*, 38. The village was about 35 miles westward from Fort Larned, Kansas.

vations within what is now Oklahoma. For these concessions they were to receive certain annuities and other goods (that is, rations) for a term of thirty years, together with schools and the usual agency instructors in civilization. Treaties of nearly similar tenor were concluded by the same commission with the Sioux, Crows, and Northern Cheyenne and Arapaho, at Fort Laramie, Wyoming, in April and May, 1868.[1] The territory between the Arkansas and Cimarron rivers, in Oklahoma, was designated as a reservation for the Southern Cheyenne and Arapaho, but by Executive order of August 10, 1869, the later reservation, now allotted in severalty, was substituted.[2] The Northern Arapaho were afterward assigned to the Shoshoni reservation in Wyoming, while the Northern Cheyenne were finally placed by Executive order in 1884 on their present reservation at the head of Rosebud river, Montana, just east of the Crows.[3]

OUTBREAK OF 1868—ARICAREE FORK AND THE WASHITA

Notwithstanding the treaty and their peaceful professions, the Southern Cheyenne and Arapaho, in the summer of 1868, suddenly began a series of raids and outrages in Kansas, for which this time there was not a shadow of provocation, and to make the enormity of the offense the greater the murders were committed with the very guns and ammunition with which the Indians had just been supplied by the Government at their own urgent request, ostensibly for the purpose of procuring buffalo for their winter meat supply. The first outrage was committed by a party of about 200 Cheyenne warriors, with some Sioux and Arapaho, on Saline river, northward from Fort Harker, Kansas, on August 10. Two days later the same party murdered seventeen settlers on Solomon and Republican rivers, and

[1] See treaties in *Indian Affairs: Laws and Treaties*, II, 977–89, 998–1015, 1904; Royce, Ind. Land Cessions, *Eighteenth Rep. Bur. Am. Ethnol.*, II, 846–49, and maps, 1899. For detailed notice of the Medicine Lodge treaty, see Mooney, Calendar Hist. Kiowa Inds., *Seventeenth Rep. Bur. Am. Ethnol.*, II, 181–86, 320–21, 1898.

[2] Royce, Indian Land Cessions, *Eighteenth Rep. Bur. Am. Ethnol.*, II, 846–47, 852–53, 1899; *Ind. Affairs: Laws and Treaties*, I, 839–41, 1904.

[3] Royce, op. cit., 918 and map; *Ind. Affairs: Laws and Treaties*, I, 860, 1904.

were driven off by a detachment of the Seventh cavalry from Fort Zarah. In addition to the murder of settlers eleven houses were burned and nine women outraged. Simultaneously, attacks were made by other bands on troops and wagon trains in southern Kansas. Within the next three months, exclusive of engagements with troops, these Indians murdered more than 100 settlers in Kansas and eastern Colorado, with the usual accompaniment of torture, mutilation, burning houses, outraged women, and children carried into captivity. At Cimarron crossing, on September 8, a wagon train was attacked and destroyed and fifteen teamsters burned to death.[1]

Vigorous measures were at once instituted under management of General Sheridan, commanding the department, and engagements were of almost daily occurrence. On Aricaree fork, eastern Colorado, September 17–25, Colonel (General) Forsyth and a company of fifty scouts successfully held off a force of several hundred Cheyenne warriors, led by Roman Nose, for eight days, until help arrived. Roman Nose himself was killed. On November 27 General Custer, with a strong column of regular and volunteer cavalry, struck a main Cheyenne camp under Black Kettle on the Washita, and entirely destroyed it, killing more than 100 Indians, burning the tipis with all their contents, shooting more than 900 horses, and capturing a number of prisoners. Black Kettle himself was among the slain. The troops lost twenty-one killed, including an entire small detachment under Major Elliott. The engagement, commonly known as the Battle of the Washita, was fought on the site of the present Cheyenne, Oklahoma. The fugitives fled to the Texas panhandle, whence they were brought back in the following spring and temporarily held in the neighborhood of Fort Supply, Oklahoma, on the northern border of the present reservation. Other encounters took place in the summer of 1869, the most important being on May 16, on Spring creek, Nebraska, and on July 11, on Summit Springs creek, Colorado,

[1] Commissioner Taylor, Supt. Murphy, Agent Wynkoop, General Sherman, Little Rock, et al., in *Rep. Com'r. Ind. Aff. for 1868*, 2–3, 64–82; *Record of Engagements with Hostile Indians*, etc., 1882; Custer, *My Life on the Plains*, 86, passim, 1874.

both fought by General E. A. Carr and the Fifth cavalry, the Indians consisting chiefly of the Dog Soldier band of Cheyenne. In the second engagement the Indians were completely routed, Tall Bull, the chief, and a number of warriors killed, more than 400 horses and mules captured, and the village destroyed.[1] Before the end of the year those who had not escaped to the Sioux country were gathered with the others about Fort Supply, to the number of about 1,100 Arapaho and 1,500 Cheyenne.[2] In May, 1870, the agency was finally established at Darlington and some civilization work begun.[3] The Cheyenne irreconcilables who had gone north to the Sioux continued, with the latter, to make small raids along the frontier.

OUTBREAK OF 1874–75 — ADOBE WALLS — THE SOUTHERN CAMPAIGN

The doubtful peace continued on the reservation until the spring of 1874, when "nearly all the Comanches and Cheyennes and more than one half of the Kiowas"[4] went out together on the warpath. The immediate inciting cause of the outbreak was the establishment of a company of buffalo hunters from Dodge City, Kansas, in an abandoned trading post known as the Adobe Walls, on the South Canadian river, in the Texas panhandle, from which headquarters they were slaughtering buffalo by thousands within the guaranteed hunting grounds of the Indians. Another special grievance with the Cheyenne was the stealing of a large herd of horses by a party apparently from Dodge City, and a disastrous encounter with the cavalry in an attempt at retaliation. Most of the Arapaho and 280 out of about 2,100 Cheyenne remained quietly near the agency.[5] In

[1] *See Record of Engagements* (for 1868–9), 1882; Custer, *My Life on the Plains*, 1874; Forsyth, A Frontier Fight, *Harpers Mag.*, June, 1895 (Battle of Aricaree fork); Mooney, Calendar History of the Kiowa Inds., *Seventeenth Rep. Bur. Am. Ethnol.*, II, 187–88, 1898 (Battle of Washita). The author has also personal information from Indians and other actors in the various engagements.

[2] Agent Darlington in *Rep. Com'r. Ind. Aff. for 1869*, 382, 1870.

[3] Agent Darlington in *Rep. Com'r. Ind. Aff. for 1870*, 265.

[4] Com'r. Smith in *Rep. Com'r. Ind. Aff. for 1874*, 10.

[5] Agents Miles and Haworth in *Rep. Com'r. Ind. Aff. for 1874;* Mooney, Calendar Hist. Kiowa Inds., *Seventeenth Rep. Bur. Am. Ethnol.*, II, 199, passim, 1898.

the meantime the Northern Cheyenne and Arapaho and the Sioux were active in Wyoming and Nebraska.

In the last week of June, 1874, a combined force of Comanche, Cheyenne, and Kiowa, numbering 700 warriors, and led by Quana, chief of the Comanche, attacked the fort of the buffalo hunters at Adobe Walls, which was defended only by some 25 men with a small field gun. After several days of close siege, but without venturing upon a general assault, the confederates withdrew with the loss of about a dozen warriors killed. The defenders lost only three men, but soon afterward abandoned the fort.[1]

On July 3 a party of Cheyenne attacked and destroyed a small wagon train in charge of Patrick Hennessey and three other men, where now is the town of Hennessey, Oklahoma. The four men were killed, Hennessey himself being seized by some Osage who came up at the same time, tied to a wagon wheel and burned alive upon a pile of grain taken from his wagon.[2] Several employés having been killed, troops were sent to protect the agency, and warning sent to friendly Cheyenne to come in, resulting in the return of White Shield and others to the number of about thirty families, who joined those under Whirlwind already there.[3]

On July 4 a severe defeat was inflicted on the Northern Cheyenne and Arapaho by Captain Bates, Second cavalry, on Badwater creek, Wyoming, as a result of which most of them soon afterward came in and surrendered.[4]

In the south the campaign was organized by the formation of four columns from different directions, to converge simultaneously upon the rendezvous of the hostiles about the heads of Red river and the Washita. Colonel Mackenzie, Fourth cavalry, moved north from Fort Concho, Texas; Major Price, Eighth cavalry, moved down the Canadian from New Mexico;

[1] Agent Miles in *Rep. Com'r. Ind. Aff.* for 1874, 233–34; *Record of Engagements*, 40, 1882; Mooney, Calendar History Kiowa Inds. *Seventeenth Rep. Bur. Am. Ethnol.*, II, 203, 1898.

[2] Miles and Mooney, op. cit.

[3] Agent Miles, op. cit.

[4] *Record of Engagements*, 40, 1882

Colonel Davidson, Tenth cavalry, moved west from Fort Sill, Oklahoma; and Colonel (General) Miles, with parts of the Fifth infantry and Sixth cavalry, moved south from Fort Supply.[1]

The result was that the hostiles were unable to make any successful stand for resistance and the campaign resolved itself into a pursuit of scattered fugitive bands. On August 30, Miles struck the Indians on the headwaters of the Washita and drove them back, in a running fight, across Red river and out upon the Staked plain. On September 26–27, Mackenzie, after two preliminary skirmishes, surprised the main Cheyenne camp on upper Red river, destroying more than 100 tipis and capturing their entire outfit, including more than 1,400 horses and mules. On October 24, Major Schofield, of Davidson's column, captured on Elk creek an entire Comanche camp of more than 300 men, women, and children, with horses exceeding 1,500. In consequence of this blow, others soon after came in and surrendered, with their arms and horses. On November 8, near McClellan creek, in the Texas panhandle, Lieutenant (General) Baldwin, Fifth infantry, struck and defeated the Cheyenne, rescuing two children of the Germaine family, whose parents, brother, and sister had been murdered in Kansas two months before. Two older sisters were surrendered in the spring. The defeated Cheyenne were pursued by Captain Viele with a detachment of the Tenth cavalry for nearly a hundred miles. On December 28, Captain Keyes of the same regiment captured an entire band of Cheyenne on the North Canadian after nearly as long a chase. Active operations were kept up throughout the winter, which was one of unprecedented severity, with such result that the Indian power of endurance was broken, small parties drifted into the agencies, and at last, on March 6, 1875, the main body of the Cheyenne, under Gray Beard, Stone Calf, Bull Bear, and other chiefs, surrendered at Darlington, where they were disarmed and their ponies confiscated.[2]

[1] Ibid., 41–42; Miles, *Personal Recollections*, 163–64, 1896.

[2] For campaign of 1874–75, see *Record of Engagements*, 38–48, 1882; Miles, *Personal Recollections*, 156, passim, 1896; Com'r. Smith, Supt. Hoag, Agents Miles and Haworth, in *Rep. Com'r. Ind. Aff. for 1875*; Mooney, Calendar Hist. Kiowa Inds., *Seventeenth Rep. Bur. Am Ethnol.*, pt. 2, 199–218, 1898.

Of their condition at the time, their agent says: "A more wretched and poverty-striken community than these people presented after they were placed in the prison camp it would be difficult to imagine. Bereft of lodges and the most ordinary of cooking apparatus; with no ponies or other means of transportation for wood or water; half-starved, and very little to eat, and scarcely anything that could be called clothing, they were truly objects of pity; and for the first time the Cheyennes seemed to realize the power of the government, and their own inability to cope successfully therewith." [1]

By the opening of June, 1875, most of the hostile Comanche and Kiowa had come into Fort Sill and surrendered, and the outbreak was at an end. About seventy prisoners were selected for military confinement at Fort Marion, Florida, including thirty-three Cheyenne and two Arapaho. While the Cheyenne prisoners were being manacled at the Darlington agency, April 6, a struggle ensued, resulting in the stampede of a large part of the tribe to the sand hills on the river just above the agency, where they had hidden a quantity of arms before surrendering. A sharp engagement ensued in which eleven Indians were killed and a number of soldiers wounded. Most of the fugitives afterward gave themselves up, but some escaped to the north. One party of about seventy Cheyenne, who had not surrendered, in attempting to reach the Sioux country, was intercepted on Sappa creek, northwest Kansas, April 23, by Lieutenant Henely of the Sixth cavalry, and nineteen warriors killed, the camp burned, and a large number of horses captured.[2] On the last day of September, 1875, the agent in charge at Darlington reported 1,611 Cheyenne present, 411 fled to the north, and thirty-three sent south as prisoners, a total of 2,055 Southern Cheyenne. Of Arapaho there were present 1,649, fled north thirteen, prisoners to Florida two, a total of 1,664 Southern Arapaho. At the same time the Northern Cheyenne proper, in

[1] Agent Miles in *Rep. Com'r. Ind. Aff. for 1875*, 269.

[2] *Record of Engagements*, 46–47, 1882; Agent Miles in *Rep. Com'r. Ind. Aff. for 1875*, 268–69. It was officially reported that Black Horse, the prisoner who made the first resistance to the manacling process, was killed while trying to escape. He was wounded, but recovered, and is still living near Cantonment.

Dakota, were reported at 1,727, a total for all the Cheyenne of 3,782 souls. The Northern Arapaho were reported at 1,552, making the Arapaho total 3,216.[1] The two tribes in 1906, north and south, numbered officially 3,334 and 1,758. Notwithstanding their great losses in tipis, horses, and equipments during the outbreak, it does not appear from the official war record that the Cheyenne, north and south, lost more than about seventy killed during the entire period.

THE NORTHERN CAMPAIGN — CUSTER MASSACRE — MACKENZIE

The western Sioux, led by Crazy Horse and Sitting Bull, with the Northern Cheyenne and Arapaho, still refused to come in upon reservations, and continued to rove about the country, coming into frequent collision with troops and citizens, with the result that early in 1876 Generals Terry and Crook were directed to begin active operations against them.[2]

On March 17, Colonel Reynolds, with about 500 men of the Second and Third cavalry, struck the camp of Crazy Horse on Little Powder river, Montana, routing the Indians, more than a third of whom were Cheyenne, destroying more than a hundred tipis and capturing a "perfect magazine of ammunition, war material and general supplies."[3]

On June 17, General Crook, with about a thousand men of the Second and Third cavalry, Fourth and Ninth infantry, together with 262 Crow and Shoshoni scouts, encountered the main force of the hostiles in a cañon near the head of Rosebud river, Montana, the Indians themselves beginning the attack. After a desperate fight the Indians were finally driven off, but with considerable loss on both sides. It was now apparent that Crazy Horse had been reinforced from the reservations.[4]

In the meantime General Terry had concentrated at the junction of Powder river and the Yellowstone, Montana, a strong force of about a thousand men, including the whole of the Seventh cavalry. Here he was joined by Colonel Gibbon with

[1] Com'r. Smith (43, 49), Agent Miles (268), *Rep. Com'r. Ind. Aff. for 1875*.
[2] *Record of Engagements*, 49–50.
[3] Ibid., 50; Bourke, *On the Border*, 270–80, 1891.
[4] *Record of Engagements*, 51–52; Bourke, op. cit., 311, passim.

nearly 500 more men of the Second cavalry and Seventh infantry. By Terry's order Gibbon's column, on June 22, moved up the Bighorn river, while General Custer, with the whole of the Seventh cavalry, moved up the Rosebud. The result was the disastrous "Custer massacre" on the Little Bighorn, June 25, 1876, in which General Custer with five entire troops of the Seventh cavalry, to the number of more than 200 officers and men, lost their lives at the hands of an overwhelming force of Sioux and Cheyenne, with a few Northern Arapaho. At the same time, and again on the following day, the rest of the Seventh cavalry, under the immediate command of Major Reno and Captain Benteen, was desperately engaged in the immediate neighborhood with the loss of 50 killed and more than that number wounded, the enemy finally retiring on the approach of the main column under Terry and Gibbon. The Indian force consisted of Sioux under Crazy Horse, Gall, Sitting Bull, and others, with Cheyenne under Ice Bear, making an immense camp of perhaps 8,000 men, women, and children, with an officially estimated minimum of 2,500 warriors. The whole number killed with Custer and Reno was 259, in addition to 50 wounded, two of them mortally.[1]

Numerous minor encounters took place throughout the summer and fall, mostly to the disadvantage of the Indians. Before the end of October some 3,000 had surrendered or been taken. Sitting Bull, Gall, and others, with their followers, fled into Canada. On November 25 Colonel Mackenzie, Fourth cavalry, with a strong force of nearly 1,500 cavalry, infantry, and artillery, and 363 Indian scouts, struck the main camp of the Northern Cheyenne on Crazy Woman creek, Wyoming, killing a number of Indians, destroying 173 tipis with all their contents, and capturing about 500 ponies, with a loss to the troops of but five men killed.[2] In consequence of this defeat,

[1] *Record of Engagements*, 52–57; Robinson in *South Dakota Hist. Coll.*, II, 426–38, 1904; Finerty, *Warpath and Bivouac*, 181–197, 1890; Miles, *Personal Recollections*, 198–211, 1896. Finerty (pages 455–58) gives the official roster of killed and wounded, but seems to be in error in his count.

[2] *Record of Engagements*, 63–65, 1882; Bourke, *Mackenzie's Last Fight with the Cheyennes*, 1890; Bourke, *On the Border with Crook*, 388–96, 1891; Miles,

Dull Knife, Little Wolf, and other Cheyenne chiefs soon after came in and surrendered. A vigorous winter campaign by Colonel (General) Miles completed the surrender of most of the remaining hostile Sioux and Cheyenne in the spring of 1877.[1] In the summer of the same year the Northern Cheyenne, to the number of nearly 1,000, were brought down to the reservation occupied by their kindred in Indian Territory, leaving only a few families among the Sioux at Red Cloud agency. The Northern Arapaho, by their own request, were gathered on the Shoshoni reservation in Wyoming. Others of the Northern Cheyenne went south in the following year. In accord with the terms of surrender they were allowed to retain their guns and horses.[2]

FLIGHT OF THE NORTHERN CHEYENNE

A large part of the removed Northern Cheyenne, under the leadership of Dull Knife, Little Wolf, Hog, and other chiefs, refused to accept the situation and insisted on being returned to the north. This feeling of dissatisfaction, to men accustomed to a cool climate and pure water, was intensified by the prevalence of a malarial epidemic, by which 2,000 Indians were prostrated at one time, so that the supply of medicine was exhausted and hundreds of sufferers were refused relief. Notwithstanding the watch kept on their movements, they broke away on the night of September 9, 1878, to the number of 89 men and 246 women and children, leaving their tipis standing to deceive the soldiers. Hundreds of troops were at once started from half a dozen posts to overtake or intercept them, while others were ordered out along the line of the Kansas Pacific and Union Pacific railroads, to prevent their crossing, and trains and locomotives with steam up were held in waiting to be instantly ready on the flash of the telegraph. In spite of all, this desperate little band of fugi-

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Personal Recollections, 221–56, 1896; Finerty, *Warpath*, 293–94, 1890; Bourke (*On the Border*) makes it 205 tipis and 705 ponies, besides as many more horses killed by the Cheyenne themselves.

[1] *Record of Engagements*, 66–69; Bourke, *On the Border*, 393–96; Miles, op. cit., 221–56.

[2] Com'r. Hayt and Agent Irwin in *Rep. Com'r. Ind. Aff. for 1877*, 19, 62; *Record of Engagements*, 78.

tives swept across Oklahoma and Kansas, burning houses, killing more than forty settlers, and committing other outrages, remounting with 250 fresh captured horses, crossing the Kansas Pacific road between the infantry patrols and a few hours ahead of the pursuing cavalry, and then the Union Pacific in Nebraska by the same narrow margin of pursuit, until they reached the sand hills on the Dakota border, where, on October 10, the exhausted troops temporarily gave up the chase. In their flight of more than five hundred miles, besides the damage inflicted on the settlements, the Cheyenne warriors had fought three engagements with more than double their own number, with a loss to the Indians of 15 killed. From two prisoners taken later it was learned that they were trying to reach their kinsmen, supposed to be in southern Montana, where, if allowed to remain, they intended to surrender, but otherwise would push on to join Sitting Bull in Canada.

In the meantime, however, the most of the outstanding Northern Cheyenne, to the number of 182, were already on their way to the south in charge of the noted Government scout, Ben Clark, who, with rare tact and courage, succeeded in avoiding the track of the raiders and keeping his own prisoners in ignorance of what was going on until he had them safely landed at Fort Reno in Oklahoma.

Reinforced by more than 400 fresh troops and a number of Sioux from the Red Cloud agency, the pursuit of the fugitives in the sand hills was resumed, with the result that on October 23 Captain Johnson, Third cavalry, captured Dull Knife's band, 149 in number, and brought them to Fort Robinson, Nebraska, where they were confined in an empty barrack room, still protesting that they would die rather than be taken back to Indian Territory. The remainder of the fugitives, under Little Wolf, had escaped under cover of a snow-storm.

. "The headmen of the Cheyennes then in confinement at Fort Robinson were notified by the military on the 3d of January [1879] that the authorities in Washington had decided to send them back south. On the next day, after consultation with the rest of the captives, Wild Hog, as spokesman, gave an unequi-

vocal negative to the proposition, declaring their intention to die before complying with the order. The prisoners numbered at this time forty-nine men, fifty-one women, and forty-eight children. It was then attempted to starve and freeze them into submission, and for five days they were deprived of food and fuel, and for three days of water also. This experiment proving ineffectual, on the 8th of January it was decided to arrest Wild Hog as the leader of the opposition. He was with difficulty induced to come out of the prison, and after a struggle in which a soldier was stabbed, he was ironed. Upon this the Indians in the prison barricaded the doors, covered the windows with cloth to conceal their movements, tore up the floor, and constructed rifle-pits to command all the windows.

"As early as November 1, 1878, Red Cloud had requested that their knives be taken from these prisoners to prevent them from taking their own lives in case they should be ordered south. This, however, appears not to have been done, neither had they been wholly disarmed, for they were the possessors of at least fifteen guns (in addition to the two obtained from the dead sentinels) and some revolvers, and were well supplied with knives.

"About 10 o'clock on the night of January 9, the Indians commenced firing upon the sentinels, killing two and wounding a corporal in the guard-room, and made their escape through the windows, the women being driven in front of the men in their flight. They were pursued by the troops, and most of their number were eventually killed." [1]

Of the 149 men, women, and children under Dull Knife who had been held at Fort Robinson, 32 were killed in the desperate sortie and 71 were retaken, leaving only 46 to get away, of whom 19 were warriors. After several skirmishes and escapes these were intercepted near the fort on January 22 by Captain Wessells with four troops of the Fourth cavalry, and, on still refusing to surrender, the troops charged their position, killing 23 and capturing nine, several of whom were wounded, leaving, so far as known, only 14 of the whole band to make their final escape and join the other fugitives with Little Wolf.

[1] Com'r. Hayt in *Rep. Com'r. Ind. Aff.*, xvii, 1879.

On March 25, Little Wolf's band was surrounded by a force under Lieutenant Clark, Second cavalry, near Boxelder creek, South Dakota, and surrendered, being 33 men, and 81 women and children. They were brought in under escort of the troops to Fort Keogh, Montana. Of the supposed 335 who had broken away from the southern agency, 72 were officially reported killed, 206 retaken, and only about 60 finally escaped.[1] However, it might be said that they won their fight, for, as it was evident that the Northern Cheyenne could not profitably be held in Oklahoma, steps were taken for their return to their old home. The removal was accomplished by instalments within the next few years, the transfer being made first to the Pine Ridge Sioux reservation in South Dakota and thence to Montana, where they were finally assigned a reservation in 1884,[2] although a large number continued to reside at Pine Ridge for some years longer.

LATER HISTORY — CIVILIZATION, ALLOTMENT, AND CITIZENSHIP

In July, 1885, some trouble occurred on the southern reservation between the cattlemen and the Indians, emphasized by the killing of the son of chief Little Robe and the stealing of Indian stock by white thieves. The Cheyenne again assumed a hostile attitude and a large force of troops was called out, but serious trouble was averted by the prompt action of Generals Sheridan and Miles, who personally investigated conditions on the ground. The cattlemen and lawless white men were ordered out of the country and the agency placed under the efficient management of Captain (General) J. M. Lee until affairs were in

[1] *Record of Engagements*, 79–85; Com'r. Hayt in *Rep. Com'r. Ind. Aff. for 1876*, xxii–xxiv; Com'r. Hayt (xvii–xviii) and Agent Miles (58–59) in *Rep. Com'r. Ind. Aff. for 1879;* Jackson ("H. H."), *Century of Dishonor*, 66–102, 1881. According to the official *Record of Engagements*, Dull Knife was killed in one of the encounters after the escape from Fort Robinson. This is denied by the Cheyenne, who assert that he escaped to the Sioux, and according to a statement by the agent in charge at Pine Ridge it would appear that Dull Knife with a band of about 120 Cheyenne had been for some time residing at that agency until transferred to Fort Keogh, Montana, in November, 1879 (McGillycuddy in *Rep. Com'r. Ind. Aff.*, 39, 1880).

[2] See the various Cheyenne references in the *Annual Reports of the Com'r. of Indian Affairs* from 1881 to 1886.

H'ONII-WOTOMA, "WOLF ROBE"—CHEYENNE CHIEF AND CEREMONIAL LEADER, AET. 58

a settled condition. At the same time a force of 120 young warriors was enlisted by the military authorities to serve as scouts at the neighboring posts.[1]

The close of the war period and the settlement of the Indians in permanent homes gave opportunity for the inauguration of civilizing and educational work. Under the administration of Agent John D. Miles, from 1872 to 1884, schools were established and farming begun among the Southern Cheyenne, together with regular missionary work by several denominational bodies. The Northern Cheyenne were about ten years later to come under similar influences. About the close of 1889 the Messiah doctrine of the Ghost Dance religion took strong hold upon both bands, as upon nearly all the other tribes of the plains and mountains, the excitement continuing, with waning power, for several years.[2] A principal leader of the movement among the Northern Cheyenne was Porcupine, who still keeps up his apostleship along the line of temperance reform.

In November, 1890, a radical change in the affairs of the confederated Southern Cheyenne and Arapaho was brought about by the negotiation of an allotment agreement, by which each individual was confirmed in possession of 160 acres of land, inalienable for a term of years, the rest of the reservation being then sold and the proceeds placed to the credit of the Indians, who, by the same process, were invested with the rights of citizenship. The agreement was ratified by Congress in the following March, and the reservation formally opened by proclamation on April 19, 1892.[3] It is now occupied by more than 200,000 white people, among whom the aboriginal owners are practically submerged. Those upon the Montana reservation are conservative and still backward in regard to civilization in spite of Government and missionary effort.

[1] Miles, *Personal Recollections*, 432–34, 1896; Agent Dyer in *Rep. Com'r. Ind. Aff. for 1885*, 73–81; Acting Agent Captain Lee in *Rep. Com'r. Ind. Aff. for 1886*, 114–24.

[2] See Mooney, Ghost Dance Religion, *Fourteenth Rep. Bur. Am. Ethnol.*, pt. 2, 1896.

[3] *Ind. Affairs: Laws and Treaties*, Kappler ed., 1 (Laws), 415–19, 955–58, 1904.

POPULATION

Owing to the remoteness of the Cheyenne from the lines of trade and travel until their settlement on the Arkansas, the early estimates of their population are unreliable. Thus, Lewis and Clark in one place give them 300 tipis and in another only 110, while Bradbury credits them with scarcely 100 warriors in 1811 as against the 500 warriors of Brackenridge only three years later. Most of the estimates appear to include also the Sutaio. The best early estimate is probably that of Morse, who puts them at 3,460 in 1822.[1] A study of the figures seems to indicate a steady increase, interrupted by the cholera visitation, up to about 1863, when they probably reached their greatest strength, with perhaps 4,000 souls, of whom more than 1,000 may have been fighting men. In the war period from 1864 to 1879 they lost about 500 souls in actual battle with the whites, besides the large number, especially of children, who must have died of starvation and exposure. In 1875, when they were for the first time brought under effective Government supervision, a careful census gave the Southern division 2,055 and the Northern division 1,727, a total of 3,782 for the whole tribe. In 1906 they were officially reported at 1,894 and 1,440 respectively, a total of 3,334, being a decrease of about 12 percent in one generation.[2] Although a number of individuals have some of white, Mexican, or even negro admixture, they are on the whole a full-blood Indian tribe, with considerable strain by intermarriage or capture from almost every tribe of the plains.

ORGANIZATION

THE CAMP-CIRCLE DIVISIONS

Before the separation into the two main divisions the tribe was governed by a council of forty-four chiefs, regularly elected in ceremonial form at intervals of a few years. Of these forty

[1] Morse, *Rep. to Sec'y War*, app., 254, 1822.

[2] See census in *Reports of the Commissioner of Indian Affairs* for those years. The early estimates give the Arapaho a larger population than the Cheyenne, although they are now far behind and rapidly decreasing. In 1875 the whole tribe numbered 3,216, and in 1905 only 1,768, a decrease of nearly 45 percent in thirty years.

contd

(Double plate)
Plate 12

CHEYENNE CAMP CIRCLE

Divisions

ORIGINAL:

1. Hevĭ'qs-nĭ''pahĭs.
2. Hévhaitā'neo.
3. Măsĭ''kotă *alias* Hotămitā'neo.
4. O'mĭ'sĭs.
5. Sŭtaio (an incorporated tribe).

SECONDARY:

6. Wŏ'tapio. } Offshoots from No. 2.
7. Oĭvimána. } Offshoots from No. 2.
8. Hĭsiometā'neo. } Offshoots from No. 2.
9. Óqtogŏ'na. } Offshoots from No. 3.
10. Hów'nowa. } Offshoots from No. 3.

PSEUDO-DIVISIONS:

11, *a*. Anskówĭnĭs, "narrow nose bridge" (Mooney, 1891). Local band of No. 4. Either this or No. 12 is the "Outlaw band" of Dorsey.

12, *b*. Pĭ'nûtgû, "Penate'ka Comanche" (Mooney, 1891). The friendlies of 1874–75.

13, *c*. Móĭseo, "Monsoni." Traditional friendly tribe, the Monsoni, represented by a few descendants among the Cheyenne.

14, *d*. Moqtă'vhaităneo, "Black Men," i. e., Ute. A family group, perhaps of Ute descent.

15, *e*. Ná'koimana, "Bear band." A family group among the Southern Cheyenne, from a former chief named "Bear."

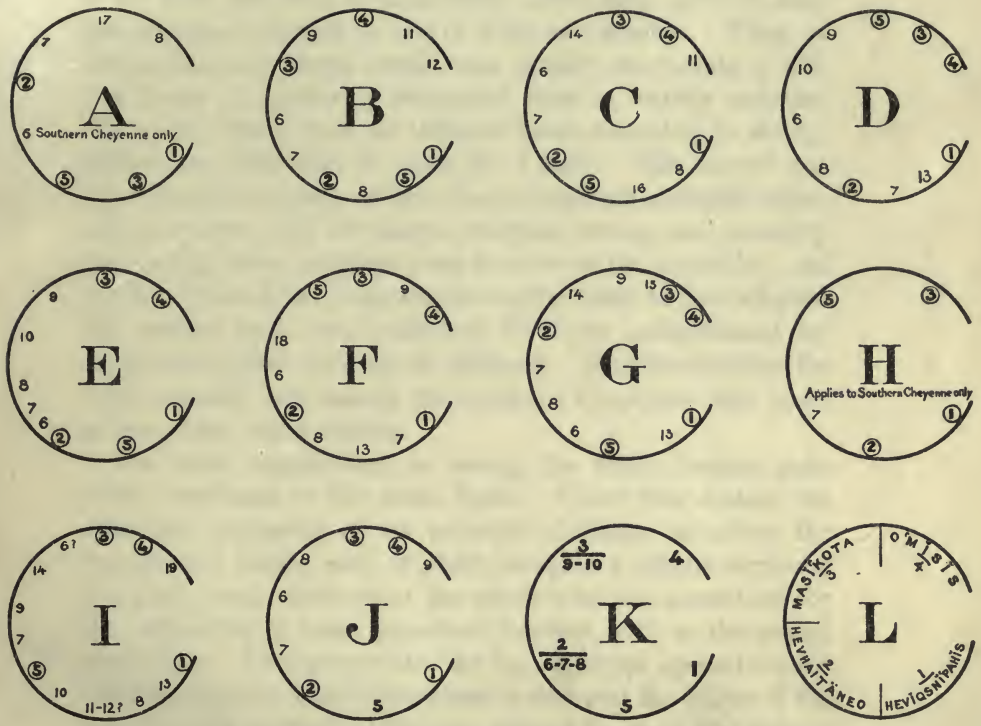
16, *f*. Dzĭtsĭ'stās, "Cheyenne." Claimed by some as the name of a nucleus division, as well as of the whole tribe.

17, *g*. Máhoyom, "Red tipi." A family group of No. 10.

18, *h*. Totóimana, "Backward," i. e., "Shy" band. A family group of the Northern Cheyenne.

19, *i*. Wóqpotsĭt, "White Wolf." A family group of mixed No. 2 and No. 5, taking its name from a chief.

plate 12



CHEYENNE CAMP CIRCLE

AUTHORITIES: A — Southern Cheyenne Circle, according to the Clark MS., 1885 (*fide* Grinnell letter). B — Mooney, first information, 1891; Fourteenth Rep. Bur. Am. Ethnology, pt. 2, 1896, fig. 100, p. 1025. C — Howling Wolf (born 1849), informant, January 1902. D — Grinnell, letter, January 1903, and in *Congress of Americanists* for 1902, 1905. E — Big Jake (born 1834), informant, June 1903. F — Mad Wolf (born *ca.* 1829), informant, June 1903. G — Wolf Robe (born *ca.* 1840), informant, 1904. H — Dorsey, *The Cheyenne: Ceremonial Organization*, pl. II, March 1905. I — Dorsey, *The Cheyenne: The Sun Dance*, pl. XIX, May 1905. J — Lone Wolf (born 1838), informant, February 1906. K — Order of divisions about 1840. L — Probable earliest arrangement, before incorporation of Sutaio.

F
K
E
G
H
B
G
D

were new appointees, while the other four were older men selected from the retiring ex-chiefs to serve as principal advisers to the new body. These four older chiefs were the head chiefs of the tribe, and were of equal rank, unless they chose to delegate supreme authority to one of their own number. They, as well as the subordinate chiefs, were usually also priests or officers in one or another of the sacred ritual or warrior societies. They were chosen from the different bands according to ability, without any limitation of quota for a band. This council was symbolized by a bundle of forty-four red-painted invitation sticks, still preserved with the sacred medicine arrows, and formerly sent around when occasion arose to convene the assembly. As previously noted, the Cheyenne themselves claim to have adopted this system from the traditional Ówŭ'qeo, exterminated by them shortly after crossing the Missouri. Regular elections for chiefs are still held among the Southern Cheyenne, with more or less of the old ceremony.

The tribal organization, as among the Plains Indians generally, was based on the camp circle. Under this system the tribe was composed of ten principal divisions, including the incorporated Sutaio, each of which occupied a definite section of the great camp circle when the whole tribe was assembled for the celebration of some important function, such as the annual Sun Dance. The camp circle, like the single tipi, opened toward the east, and the order of progression followed the course of the sun, from the entrance at the east, around by south and west to north and the place of beginning. At the Sun Dance of the Southern Cheyenne in 1893, the author counted more than 400 tipis in the great circle, which was nearly a mile in diameter. Before the separation of the Northern Cheyenne it may easily have made 600 tipis.

The author's special work among the Cheyenne for the last five years depends for its accuracy upon a correct knowledge of the tribal camp circle. Particular attention was therefore given to this subject, which among the Cheyenne is particularly difficult of solution owing to the permanent withdrawal of a large portion of the tribe, the incorporation of an alien people, the

absorption of a whole division by a war society, and the formation of new groupings as the old tribal bond has weakened. Previous statements of the camp circle have been made by Clark,[1] Mooney,[2] Grinnell,[3] and Dorsey (*a* and *b*),[4] the first and fourth of these dealing only with the southern part of the tribe, and no two being entirely alike. The following statement of the names and order of the recognized divisions is now submitted as the result of repeated consultation, both separately and in council, with the oldest and most generally recognized authorities in the tribe, together with numerous other representatives of each section. The forms vary somewhat according to dialectic differences. It is evident that in some instances the divisions are older than their existing names. Almost every name has received more than one interpretation :

1. *Hevĭ'qs-nĭ'ᶜpahĭs*, alias *Hevĭ'sts-unĭ'ᶜpahis* (singular, *Heviqs-nĭ'ᶜpa*), "aortas closed, by burning." All authorities agree that this was an important division and came first in the circle. The name is said to have originated from several of the band in an emergency having once made the roasted aorta of a buffalo do duty as a pipe. Grinnell gives this story, and also an alternate one, which renders it "small windpipes," from a choking sickness sent as a punishment for offending a medicine beaver. The name, however, in its etymology, indicates something closed or shriveled by burning. The beaver story exists, but the beaver tabu is not limited to members of this division, one of the most prominent examples, Iron Shirt, being a member of No. 8. Many such tabus depend upon the shield carried by the individual, and cease for him when the shield is discarded. The Clark manuscript renders it "smoky lodges." *Aorta band*—Dorsey.

2. *Sŭtai'o* (singular, *Sŭ'tai*), meaning unknown. Formerly a

[1] Ben Clark, *Ethnology and Philology of the Cheyennes*, MS., about 1885.

[2] Ghost Dance Religion, *Fourteenth Rep. Bur. Am. Ethnol.*, 1892–93 (1896). This was based on the author's first information, obtained in 1891.

[3] Social Organization of the Cheyennes, in *Cong. Americanists*, N. Y. Meeting, 1902 (1905).

[4] *a*, The Cheyenne : Ceremonial Organization, *Field Columbian Museum Pub.*, March, 1905 ; *b*, The Cheyenne : The Sun Dance, ibid., May, 1905.

distinct tribe, but now incorporated, as already noted. Grinnell puts them in the north part of the circle; Dorsey and one of the author's Indian informants put them northwest; the Clark manuscript, and all but one of the author's Indian informants, including the hereditary chief and his mother, the oldest woman of the band, put them south, extending southwest. The discrepancy may arise from a possibility that, being an adopted people, their place in the circle was not at first definitely fixed. The majority of the band is now settled on the Washita about Clinton, Oklahoma. *Half Cheyenne band* — Dorsey.

3. *Hévhaitä'neo* (singular, *Hevhaitän*), "hair men," i. e., "fur men." Said to have been so called because in early days they ranged farthest to the southwest, remote from the traders on the Missouri, and continued to wear fur robes for common use after the other bands had adopted strouding and calico. Another explanation is that, ranging farther south to steal horses, they were accustomed to carry extra reatas woven from buffalo hair, the same word, *eva*, meaning both fur and rope. They were a large and important division, and formed the advance of the emigration to the Arkansas in 1833, for which reason the name is sometimes used as synonymous with Southern Cheyenne. Nos. 4, 5, and 6 are offshoots from this division. *Hairy band* — Dorsey.

4. *Oi'vimána* (singular, *Oivimán*), "itch, hives, or scabby people" (*óiv*, itch, hives; *óists*, scab; *man*, a band). An offshoot of the Hévhaitä'neo (No. 3). The name originated about 1840, when a band of the Hévhaitä'neo, under a chief known as Blue Horse, became infected from having used a mangy buffalo-hide for a saddle blanket. Another authority makes the origin much more recent, dating from about 1860, when a subordinate chief named Bear Tongue, who died about 1878 and whose son is still living, became infected with the itch, and communicated the disease to his immediate followers. They have become an important division. According to Grinnell, the name is also applied as a nickname to a part of the Northern Cheyenne on lower Tongue river, Montana, "because, it is said, Badger, a principal man among them, had a skin disease." *Scabby band*, *Hive band* — Dorsey.

5. *Hĭsiometă'neo* (singular, *Hĭsiometăn*), "ridge men," referring to the ridge or long slope of a hill. Another offshoot from the Hévhaitä'neo. The name is said to have originated some sixty years ago, from their having formerly ranged at the head of Smoky Hill river, in that portion of Colorado known to the Cheyenne as the "ridge country"; or, according to another authority, from habitually ranging upon the Staked plain in association with the Comanche. They are commonly said to have originated from some Sutaio men who intermarried with Hévhaitä'neo women before the regular incorporation of the Sutaio tribe. One authority makes them of Măsĭ'kotă origin. *Ridge men* — Dorsey.

6. *Wŏ'tapio* (singular, *Wŏ'tap*), "eaters," from the Sioux word, *wota*, "to eat." A small division, perhaps of Sioux admixture. Authorities agree that the name is of Sioux origin, but while some (Big Jake, born 1834, and others) claim the division as an offshoot from No. 3, others (Lone Wolf, born 1838, and others) dispute this, and say that it is an old division. The facts that the band is a small one, and that the name is foreign and a duplication of the native name of a principal division, seem to indicate that the division is not ancient. *Cheyenne Sioux* (?) — Dorsey.

7. *Măsĭ'kotă* or *Masĭskota* (singular, *Masĭ'kot*), of doubtful meaning, interpreted as "corpse from a scaffold" (Clark MS.), or "ghost head, i. e., gray hair" (Grinnell), but more probably from a root denoting "wrinkled," or "drawn up," as applied to old tipi skins or old buckskin dresses; from this root comes *masĭ'skot*, "cricket," referring to the doubling up of the legs; the same idea of "skin drawn up" may underlie the interpretation "corpse from a scaffold." No satisfactory reason is assigned for the name. This is one of the leading divisions in the tribe. For some cause, apparently between 70 and 80 years ago, all the men of this division joined in a body the Hotámitä'neo (Dog Soldier) warrior society, so that the two names became practically synonymous until the society name supplanted the division name, which is now obsolete, the Hotámitä'neo, with their families, being considered owners of that part of the circle

originally occupied by the Măsĭ'kotă, viz, next to the last section, adjoining the O'mĭ'sĭs (No. 10), who camped immediately north of the entrance. The division — or society — is frequently known as *Mĭ'stai-Vihinot*, "owl eyebrows," or simply *Vihinot*, originally a nickname applied to Cedar Grove, a chief of the Dog Soldiers about forty years ago and still living, who never pulled out his eyebrows according to common Indian custom. *Dogmen band* — Dorsey.

8. *Hów'nowa* (singular, *Hów'now'*), "poor." A small division, commonly regarded as an offshoot of No. 7, either directly or by subdivision from the Oqtogŏna (No. 9). They are now practically extinct — possibly in consequence of the cholera of 1849 — and Lone Wolf (born 1838) says that those of them of his own age, whose fathers were called *Hów'nowa*, are now merged with the Hevĭqsnĭ'pahĭs (No. 1). No reason is given for the name, which is of plain etymology. *Poor People* — Dorsey.

9. *Ó́qtogŏ'na* or *Ó́qtoóna* (singular, *Ó́qtogón*). This name has been interpreted as "bare shins," or "no leggings," but is claimed by one of the best authorities in the tribe (Lone Wolf) to indicate "prominent lower jaws," from *hĭsĭ'og* (plural, *hĭstogonots*), "jaw bone." No reason is assigned for the name. This division, like No. 8, is said to have been originally a band of Măsĭ'kotă. It is now virtually extinct, those who claim the descent being scattered among the other divisions. According to Grinnell, its decline is due to the great cholera epidemic of 1849. *Prominent Jaws* — Dorsey.

10. *O'mĭ'sĭs* (singular, *Ómĭsĭsts*), "eaters." The meaning of the name is plain, but its origin is disputed, some authorities claiming it as the name of an early chief of the division, while Grinnell gives two stories, one, that it was bestowed because the members of this division "were not scrupulous as to their food," some preferring tainted meat; the other, that, because of their superior hunting energy, the men of this band had always plenty to eat (cf. *Wŏ'tapio*, No. 6). This was the largest and most important division in the tribe and now constitutes the majority of the Northern Cheyenne, for which portion of the

tribe the name is therefore frequently used as a synonym. Before the tribe was divided they occupied that portion of the circle immediately north of the eastern entrance, thus completing the circle. After the separation their next neighbors in the circle, the Măsĭ'kotă, alias Hotámitā'neo, were considered as the last division in order. *Eaters, Northern Cheyennes* — Dorsey.

Besides these generally recognized ten divisions, we find a dozen or more names or nicknames locally applied to small family or residential groups both north and south. None of these, so far as known, is recognized as constituting a proper division with a fixed place in the circle, although it is entirely probable that if the tribal development had not been rudely disturbed by the advent of the white man, several of them would in time have taken their places along with the Oĭvimána and others of recent historic origin.[1]

From the difference of opinion among the older men as to the exact circle position of the five more recent subdivisions with reference to the two principal divisions from which they derive their origin, it would seem that these minor divisions had no definite order beyond the rule which required them to set up their tipis adjoining those of the parent division. Thus, Nos. 8 and 9 adjoined No. 7, but whether before or after in the circle seems to have been of minor consequence. On one occasion, at the Sun Dance gathering, an informant had seen the Oĭvimána camp behind their parent division, the Hévhaitā'neo. With lapse of time it can hardly be doubted that a rule would have been definitely established.

BASIS OF TRIBAL ORGANIZATION

What do these divisions represent? Following the old Morgan theory of a generation ago,[2] which based all primitive society on the clan or gens as a necessary unit, it has been stated by a distinguished writer on the Plains tribes that these are true exogamic clans, in which, until a very recent period a man was

[1] For list and description, see under "Cheyenne" in the *Handbook of American Indians*, pt. 1, 1907, and the description of the accompanying plate XII.

[2] Morgan, Systems of Consanguinity, *Smithsonian Cont. Knowledge*, 1871; and *Ancient Society*, 1877.

forbidden to marry a woman of the same division, and in which the children were always of the clan of the mother. This statement appears to rest chiefly on the testimony of an educated half-breed of the tribe, who, while exceptionally well versed in the language and recent history of the Cheyenne, is not in touch with their traditional, religious, or ceremonial life. It is directly contradicted by the testimony of all the recognized priestly authorities and leaders of societies with whom the author has consulted; of Captain W. P. Clark in his *Indian Sign Language* (pp. 229 and 335, 1885); of Mr Ben Clark, official interpreter at Fort Reno for more than thirty years and author of an extended monograph on the tribe; and of the Reverend Rodolphe Petter, for sixteen years resident missionary among the Cheyenne and the only white man who has mastered the language and reduced it to grammatic analysis. It is also in contravention to the results of Kroeber, Swanton, and the present author in other fields, all tending to show that the clan or gentile system is probably lacking in a majority of the Plains tribes, and, in fact, instead of being universal, is really confined to a very limited area of the northern continent.[1] Instead of being the foundation of primitive society, as was formerly assumed, it is now known to be an artificial product of a comparatively advanced stage of sedentary culture.

[1] As the result of his earliest researches among the Plains tribes, the author stated in his monograph on the Ghost Dance Religion (*Fourteenth Rep. Bur. Am. Ethnol.*, 956, 1896): "There seems to be no possible trace of a clan or gentile system among the Arapaho, and the same remark holds good of the Cheyenne, Kiowa, and Comanche. . . . It is very doubtful if it exists at all among the prairie tribes generally." Later investigation in the same area confirmed this opinion, as expressed in the author's paper on the Kiowa (*Seventeenth Rep. Bur. Am. Ethnol.*, 227, 1898): "The clan system does not exist among the Kiowa, and there is no evidence that they have ever had it. . . . It is by no means universal, and it is doubtful if it exists at all among the Athapascan tribes of British America, the tribes of the Columbia region, Oregon, or California, or any of the recognized Shoshonean stock, with the exception of the Hopi. The Cheyenne and the Sioux of the Plains seem to know as little of it as do the Kiowa." Kroeber, in 1902, made the denial positive for the Arapaho proper (The Arapaho, *Bull. Am. Mus. Nat. Hist.*, 8, May 1902), and Swanton, after a careful canvass of the whole subject (Social Organization of American Tribes, *Am. Anthrop.*, VII, Oct.–Dec. 1905), shows that the system is absent from almost the whole of the western and northern area.

In tribes which have the clan system, as the Cherokee and the Caddo, it is so much a part of their daily life that it can hardly escape notice in even the most cursory investigation. It has persisted with them through a century of wars, removals, and pressure of civilization, and will probably endure as long as their tribal identity. It is inconceivable that a powerful tribe like the Cheyenne, not yet thirty years from the buffalo hunt and the war path, should have voluntarily thrown it away, as has been claimed, within living memory. The so-called "clan shields" and "clan tipis" are a matter of individual or close family proprietorship, and may exist at the same time in different divisions, and, with a possible single exception, the same is true of the "clan tabus."

In regard to the exogamic rule which has been claimed for these divisions, the oldest authorities state most positively, on the contrary, that as by tribal custom a young man on marrying usually went to live with his wife's people, it was the policy of the chiefs to have their young men marry within the division, in order to keep up the strength of their own band. Furthermore, as under former conditions the various bands were usually widely separated during most of the year, it would have been extremely difficult to enforce an exogamic law. Their migration tradition points to an origin in a region in which, according to Swanton, the clan system probably never existed.[1]

In the author's study of the circle organization of both Kiowa and Cheyenne he has adopted the rule of asking each informant, before proceeding to other matters, (1) his various names; (2) his age, as determined by the author's Kiowa calendar; (3) his father's band; (4) his mother's band; (5) the band of his first wife; (6) the position of his tipi in the circle; and (7) his war

[1] Having submitted the list of Cheyenne divisions to Mr Francis LaFlesche, recognized as one of our best authorities on the Siouan tribes, he writes, after examination: "There is not one that would, in the slightest degree, indicate a clan or gens system as found among the Osage, Omaha, and others of the Siouan tribes. Every name is such as would be applied to a band which acted in a peculiar manner to suggest the name. It would be a mistake to call them clan or gens names. You are perhaps right in calling them 'division names,' but even that term would imply an organization which the tribe seems not to have had in the strict sense of the word."

society. The results of such definite investigation of the family relationships of the older men of the Cheyenne tribe show conclusively that the marriage partnership was a matter of choice, husband and wife being frequently of the same band, the husband usually (but not always) going to live with his wife's people. Specific questions as to marriage laws brought out the same result. Most of these informants were already near middle age and married before 1864, the approximate date assigned by Grinnell for the breakdown of the Cheyenne clan system,[1] while their parents, of course, belonged to an earlier period.

Disregarding the minor band names as having no bearing on the circle scheme, we find that of the ten recognized camp circle divisions, one is an incorporated tribe, two are offshoots of the Măsĭ'kotă, and three have branched off from the Hévhaitä'neo, leaving only four which may be regarded as primary and original, viz: Hevĭqs'nĭ'pahĭs, Hévhaitä'neo, Măsĭ'kotă, and O'mĭ'sĭs, occupying the four segments of the circle, as separated by the intersecting lines of the cardinal points.

From this analysis of the camp circle, supplemented by study of the council arrangement, the war societies, and the heraldic symbolism of the tribe, we conclude that Cheyenne tribal life was organized, not on a clan system, but on a ceremonial geographic basis, as determined by the four cardinal points.

While the symbolism of the cardinal points, with the related sacred *four* and the cross, enter into the medical and religious ceremonial of probably every tribe in America, they are particularly prominent in Cheyenne pictography, the four cardinal points, definitely designated as *nĭv-stäniwó* (*nĭv*, four; *stäniwó*, the cardinal points), and represented as four equidistant triangles pointing inward around the circumference of a circle, being one of the most common symbols in shield decoration and in the corresponding face paint of the warrior. With the Kiowa, on

[1] "Marriage within the gens was not permitted, and it was not until about the year 1864 that people began to disregard this law concerning marriage and openly to violate it, and to marry their cousins." — Social Organization of the Cheyennes, *International Congress of Americanists*, New York meeting, 1902, 135, 1905.

the contrary, although the same symbolism exists, the pictograph does not once occur on more than a hundred shields studied by the author.

WARRIOR ORGANIZATION — OTHER SOCIETIES

Among the Plains tribes generally, the men and boys are organized into warrior societies, varying usually from six to twelve in number, each having its special equipment, dance, songs, and ceremonial function. The system is so closely identical in all the tribes as to render it probable that, as now existing, it has spread from a common starting point, probably on the upper Missouri and subsequent to the introduction of the horse, superseding in each tribe whatever equivalent organization may have existed previously. The Cheyenne have six such societies, known collectively as *nŭ'tqio* (singular, *nŭtaq*), "warriors," viz:

1. *Hotámitä'neo*, "dog men"; the celebrated "Dog Soldiers," the most important, distinct, and aggressive of all the warrior societies, deducing their name and ritual from the instruction given by a supernatural dog to their original founder. The meaning and reason of the name are beyond question, but the word is also susceptible of the rendering "behind, or backward, men," owing, as Petter explains, to the fact that the word for dog, *hotam*, is itself from a root conveying the idea of "following behind." They have practically absorbed the whole Măsĭ'kotă division (q. v.), as already explained.

2. *Woksíhitäneo*, "fox men" (specifically, the kit, or swift, fox); so called on account of a ceremonial club with pendant skin of the kit fox, carried by the leaders; also known as *Motsónitäneo*, "flint, i. e., arrowpoint, men."

3. *Hĭ'moiyóqĭs*, "those with headed lance," from *móóqts*, "lance," so called on account of a peculiar lance carried by the principal officer; also known as *Oómi-nŭ'tqio*, "coyote warriors," from their special reverence for the coyote and for a sacred coyote skin.

4. *Máhohĭ'vas*, "red shield owners," from a special red-painted shield with buffalo-tail pendant carried by the leaders;[1]

[1] Not, as Dorsey has it, by all the members.

alias, *Hotóa-nŭ'tqio*, "buffalo-bull warriors." This society became extinct about 1896.

5. *Hɪmátănóhɪs*, "those with the bowstring" (*matánow'*); so called from a peculiar lance, resembling a long bow with a lance-head at one end, carried by the leaders; sometimes called *Ho'náa-nŭ'tqio*, "wolf warriors," from the traditional instruction given to their founder by a supernatural wolf. Although this is an important society, it is of comparatively recent origin, having been instituted by *Mɪstaí-maha*, "Big Owl," a noted medicine-man who died about forty-five years ago, leaving as his successor *Mehäts*, "Beard," who died in 1872. Although Big Owl claimed to have received the ritual from a supernatural wolf while still a young man and unmarried, it appears to be merely an adaptation from an older society among the Mandan and perhaps other northern tribes.

6. *Hotám-ɪmăsáw'*, "foolish dogs," a common ceremonial designation for young, or apprentice, warriors. This society, which is not mentioned by Dorsey, is confined to the Northern Cheyenne, and is so similar in ritual to No. 5, among the Southern Cheyenne, that members of the two societies consider themselves ceremonially related, and take part in the same dances when visiting back and forth.

We thus find that the warrior societies, like the tribal divisions, resolve themselves into an original four, indicating a possible direct connection between the society and the division in earlier times.

As these warrior societies have been treated at length by Dorsey,[1] we need not go into details here. While some are

[1] The Cheyenne: Ceremonial Organization, *Field Columbian Museum Publication 99*, Chicago, March, 1905. He calls them, respectively, Dog Men, Hoof Rattle, Coyote, Red Shield, and Inverted or Bowstring warriors, omitting No. 6, the Foolish Dogs. Although he ascribes all five of those named to the traditional prophet or culture hero of the tribe, he says (p. 3): "All of the warriors' societies are original except the Bowstring society. This society was formed after the others." Clark (*Indian Sign Language*, 1885) has Dog, Fox, Medicine Lance, Bull, Bowstring, for the first five, respectively, and adds "Chief," the council of 44 chiefs, who, however do not constitute a society. For notes on the warrior organization in other tribes, see Maximilian, *Travels*, 1843 (Blackfoot, Crow, Mandan, Hidatsa, Arikara); Clark, *Indian Sign Language*, article "Soldier" (general);

considered of higher dignity than others, each is distinct in itself, and there is no regular graduation from one to another. Any member so unfortunate as to kill one of the Cheyenne tribe, either deliberately or by accident, was at once cut off from the society and from all ceremonial functions, and no priest of the Sacred Arrow medicine would thereafter eat, drink, or smoke with him. In older times, but still within living memory, the outlawry was much more severe, and extended also to the nearest relatives of the offender, all of whom were obliged in consequence to camp apart from the main body, but probably only until propitiation had been made through the Sacred Arrows. In one notable instance, in 1837, the leader of the Dog Soldiers was thus degraded and outlawed for a murder committed in a drunken fight, although at that very time he was "carrying the pipe" to organize a great war party against the Kiowa. One man, of mild manner and much respected in the tribe for his former record, is thus cut off from society membership for an accidental killing as far back as 1873.

Of late years the native society organization of the Cheyenne, as well as of the other Plains tribes, has been greatly demoralized by the introduction of the Omaha Dance society, originating, as the name implies, among the Omaha, by whom it came first to the Sioux and then to other Plains tribes north and south, winning favor by reason of the spectacular features of the dance and the general freedom from burdensome tabus.

Besides these warrior societies, with their dances and tribal ceremonial duties, there are many smaller groupings partaking of the nature of gilds or close corporations for the purpose of guarding special secrets of healing, magic, etc., and hence commonly known as "medicine societies." Thus, there are several sets of "horse medicine" doctors, each set having its own special secret for the treatment of ailing horses, together with special tabus, and special costume, face paint, and songs for use during the treatment.

Grinnell, *Blackfoot Lodge Tales*, 1892 (Blackfoot); Mooney, *Ghost Dance Religion*, 1896 (Arapaho, etc.); Mooney, *Calendar History Kiowa Indians*, 1898 (Kiowa); Kroeber, *The Arapaho: Ceremonial Organization*, Bull. Am. Mus. Nat. Hist., 1904.

Two of the most noted medicine societies were those of the Crazy Dance and the Fire Dance. The Crazy Dancers are said, on apparently reliable testimony, to have had knowledge of some secret plant, from chewing a portion of which at their public dances they became temporarily insane and possessed of superhuman strength, tossing heavy weights, jumping immense distances, throwing strong men about like children, and doing other things impossible and unthinkable in a normal condition. The Fire Dancers, comprising a membership of about a dozen persons, danced with naked feet through and over a large bed of burning coals until they had stamped it out into dead cinders. Some of them could also chew live coals and plunge their arms into boiling water without injury. The secret was held by the leader alone, who prepared each dancer by the application of an ointment, apparently of vegetable nature. According to the testimony of one who took part in this dance under the instruction of its most noted leader, Lame Bull, the fire caused an unpleasant sensation of scorching which was more painful a day later, but no actual burning or blistering. Lame Bull died in 1901, leaving no recognized successor, although one or two persons claim to hold the secret.[1]

Several of the men's societies admit women to special parts, but the women have also their own societies, for dance, healing, and working purposes. Their separate dance societies are not numerous or of prominence in the tribal life, but the working societies, which are practically female trade unions, have, or did have until recently, absolute control of all the higher technology and decorative art of the tribe.

The members of these industrial gilds are distinguished as *Monī'nieo* (singular, *Monī'niⁱ*), "women who have chosen," i. e., specialist women. There are distinct unions for the practice and teaching of tipi cutting and fitting; for each class of tipi decoration; for each class of robe and curtain making in porcupine quill and beaded designs; for parflèche decoration; and

[1] Riggs says the Hayoka dancers among the Sioux were able to plunge their arms into boiling water by previously "deadening" the skin with an application of sheep sorrel (*Gospel Among the Dakotas*, 96, 1869).

for the more specialized moccasin and dress patterns. Each gild has its leader with her assistants, all recognized as experts in the art, and admission to the society can be gained, as with the men's societies, only by costly feasting and presents. Besides receiving instruction in every detail of the art, the initiate is taught the technical terms, with all the hidden symbolism of design and nomenclature. Women ambitious to excel in the industries of their sex would seek admission to more than one working union, but as each one was distinct from the others, a similar heavy initiation fee must be paid in each case. The system still exists, though on the verge of extinction. The common household arts, as the preparation of food, dressing of skins, and making of everyday clothing, were learned at home. It may be added that every considerable piece of woman's work is begun with a short ceremonial prayer, and the overseer of the working party is supposed to be a woman of good disposition as well as a mistress of her art.

Among the younger men there is also a system of comradeship, known by a long term which may be freely translated as "taking a friend," by which two young men, usually of the same warrior society, practically adopt each as brothers and are so recognized thereafter both by their own parents and relatives and by the tribe at large. The term of address used by one to the other is *howi'*, "comrade," or *frater*. The parents and other relatives call the adopted one "son," "brother," etc., just as though actually born in the family. The two have their horses and other property in common, and one sometimes makes his home with the other, so that a stranger might think them actual brothers. The comradeship continues after marriage and throughout life. A similar custom exists among other Plains tribes, the bond being sometimes ratified by a preliminary public announcement, which does not seem to be the case with the Cheyenne. The stories of daring rescues of wounded comrades in the face of the enemy, so frequent in accounts of frontier fights, are usually explainable in this way.

HERALDIC SYSTEM — RELIGION — HOME LIFE

Every seasoned warrior was supposed to have a shield for defensive use in battle, and the system of tabu and other regulations, the rules for painting and decoration of the shield, the owner and his horse, with the accompanying war cries, songs, and other ceremonials, made up a shield heraldry akin to that found among the Plains tribes generally. As compared with the elaborate system found by the author among the Kiowa, the Cheyenne shield system is crude and undeveloped, being in most cases rather a matter of individual whim than of strict ceremonial definition, and would appear to be of much more recent origin than among the Kiowa, who have preceded the Cheyenne both in occupancy of the Plains region and in possession of the horse, without which the shield was of small importance. The tipi heraldry, as applied to tipi decorative designs and tabu regulations hereditary in certain families, exists also with the Cheyenne.

The whole religious life of the tribe centers in the great ceremonies of the Sun Dance and the Sacred Arrows. The Sun Dance is common in some form to nearly all the Plains tribes, and was given to the Cheyenne by the Sutaio after the first peace was made between the two tribes. The Dance tradition is a part of the sacred tradition of the Sutaio, which explains also the origin of the Buffalo Cap medicine from Domsīvī'sts, "Erect Horns," the supernatural culture hero of the Sutaio. Both medicine and tradition still exist in keeping of the priest of the ritual.

The four Sacred Arrows, with the accompanying tradition and ritual, are the property of the Cheyenne proper, having been delivered to them at the beginning of their existence as a people by their own great culture hero, Motsiyóīf, "Standing Medicine." While the annual Sun Dance overshadows all other tribal ceremonials in its spectacular character and social features, the feeling with regard to the Sacred Arrows is much more deep and reverent, few of the priests or older men ever daring to speak of them freely or even to mention them by name, the whole past and future of the tribe being regarded as identified with the

sacred bundle. On certain ceremonial occasions, notably to wipe the stain of blood from the people when a Cheyenne has been slain by a tribesman, the arrows are exposed to public veneration, no woman, however, being ever allowed to look upon or approach them closely under any circumstances. Like the Ark of the Covenant, the sacred bundle was formerly carried to war to insure victory, and in this way two of the four arrows were lost to the Pawnee some sixty years ago, and have been replaced in duplicate. The tradition keeper and the custodian with the sacred bundle now reside near Cantonment, Oklahoma, the headquarters of the most conservative element of the tribe.[1] The public Sacred Arrow ceremony was performed in 1904 and perhaps later, but, unlike the Sun Dance, is, so far as possible, guarded from the knowledge of the whites.

The Ghost Dance cult, which took hold upon the Cheyenne about nineteen years ago, was foreign to the tribe, and, having entirely died out, needs no further notice here. The Peyote rite, introduced from the neighboring Kiowa more recently, is finding many adherents among the younger men, attracted by the beauty of the songs and the pleasure of the waking visions induced by the drug itself.[2]

The home life, arts, games, dress, and social and war customs of the Cheyenne were such as were common to most of the Plains tribes which dwelt in skin tipis and hunted the buffalo. Their dead were usually laid away on scaffolds in the branches of trees, occasionally in boxes upon the surface of the ground, or, more seldom, in graves dug in the earth, but were never cremated. Physically they are usually of good build and stature, and in character rank rather above the average for courage and tenacity of purpose, but with correspondingly intractable disposition.

[1] For details in regard to the Sun Dance and the Sacred Arrows, see Dorsey's valuable papers on The Cheyenne, *Publications Field Columbian Museum*, Nos. 99 and 103, Chicago, March and May, 1905. The Buffalo Cap medicine is popularly called (*Hotóa*) *Nɨmhoyóō*, "Buffalo Bull Hanging," because hung from the end of a long tipi pole on ceremonial occasions.

[2] See the author's papers on the Ghost Dance and the Kiowa, already cited.

Algonquian Affinity — Linguistic Material

The Algonquian affinity of the Cheyenne language is now clearly recognized. The trader Henry noted its connection with the Cree as early as 1806, but as his journal remained in manuscript the clew was not followed. In 1832–34 the German traveler, Maximilian, Prince of Wied, collected a vocabulary on the upper Missouri, which was published in the second volume of his Coblenz edition in 1841, and which would have been sufficient to prove the relationship had it been examined, but apparently the volume escaped the notice of Americanists outside of Germany. In 1846 Lieutenant Abert collected at Bent's Fort on the Arkansas, a vocabulary and some grammatic notes, which were published as part of a congressional document in 1848. This appeared just in time for Gallatin to utilize in his introduction to Hale's *Indians of Northwest America* with the definite statement that careful comparison proved the language to be Algonquian. As he remarks that there was no other Cheyenne vocabulary extant, it is plain that he was unaware of Maximilian's work. The Hale-Gallatin paper was published in *Transactions of the American Ethnological Society*, II, 1848. In the meantime, however, Latham, in England, had obtained possession of an advance publication of the same Abert numerals, from a study of which he was convinced that the language was Algonquian, and so announced before a meeting of the British Association in June, 1847. Although the printed paper appeared in the same year with Gallatin's, 1848, the claim of priority thus rightfully rests with Latham.

The published Cheyenne linguistic material consists chiefly of (1) a vocabulary of about 250 words, by John S. Smith, an old-time trader, in Schoolcraft, *Indian Tribes*, III, 1853; (2) a vocabulary and grammatic sketch, of 38 quarto pages, in Hayden, *Missouri River Tribes*, 1862; (3) a number of Ghost Dance songs, with glossary, by Mooney, in *Fourteenth Report Bureau of American Ethnology*, 1896; (4) a *Cheyenne Service Book*, of 20 pages, by the Reverend D. A. Sanford, Episcopal missionary, 1900; (5, 6, and 7) a *Chevenne Reading Book*, 1895, the *Gospels of Luke and John*, 1902, and a translation of the

Pilgrim's Progress, 1904, all by the Reverend Rodolphe Petter, Mennonite missionary at Cantonment and the best living authority on the language. In manuscript we have (1) *Ethnography and Philology of the Cheyennes*, 468 pages, including an extended English-Cheyenne and Cheyenne-English dictionary, by Mr Ben Clark, post interpreter at Fort Reno, Oklahoma, date about 1885, the original in the possession of Dr G. B. Grinnell, of New York, and a copy with Wellesley College, Massachusetts; (2) a *Cheyenne Grammar, with Cheyenne-English and English-Cheyenne Dictionary*, of nearly 800 pages, besides a large body of myths and sermons in the language, by the Reverend Rodolphe Petter, at Cantonment. Of this dictionary there are four copies, laboriously made for the use of the mission workers. (3) A collection of some sixty sermons by Rev. G. A. Linscheid, of Bethany Mennonite mission, Busby, Montana.

Indian Culture not Ancient

The most salient fact brought out by a study of the Cheyenne is that of the newness of everything which they have, with the single exception of the Sacred Arrow cult. In the comparatively short space of two centuries, less than half the time since the discovery of America and entirely within the period of their acquaintance with the whites, they have shifted their habitat by nearly a thousand miles, from the sheltered timber country to the open plains, have so completely lost their old life, and have borrowed so much from the tribes of their new surrounding, that if it were not for their Algonquian speech and the known facts of history, we should fail to recognize in the roving buffalo hunters of the upper Arkansas the same people who once planted corn, fished in the lakes, and built their earth-covered lodges at the head of the Mississippi. Their great Sun Dance came from one tribe; their council system from another; the Omaha dance, Ghost dance, and Peyote rite from others; their warrior organization as they now have it, their shield system, their whole equestrian habit, their tipis and their tipi life, are all of recent adoption and development. Even their scalp cult is probably modern, as Friederici shows.[1] Their very

[1] Friederici, *Skalpieren*, 1906.

blood has changed and become dilute from wholesale incorporation of captives and intermarriage with entirely alien elements — Sioux, Ute, Kiowa, and Pawnee. Their existing customs and ceremonials are under constant change, and are not now what they were even ten years ago. The same thing is proportionably true of the other tribes of the Plains, and to a less degree of the tribes of the woods and mesas, for there is nothing ancient or permanent in Indian life.

Names Given to Other Tribes

In the old days when the Cheyenne had free range from the Saskatchewan to the Rio Grande, a distance of full 1,800 miles, they had a name for every tribe of importance in this immense region. Since the roving life has been brought to a close by reservation restrictions, however, some of these names have been forgotten, and others, although still remembered, have become difficult of identification. The various names applied to any one tribe by its neighbors had frequently the same meaning, being based on the gesture sign used to designate the tribe in the common sign language of the Plains Indians.

The following list, going from north to south, is probably as nearly complete as can now be made. Hayden's list of tribe and band names [1] is included, the guttural *q* of the standard alphabet being substituted for the dotted *h* of Hayden. In the Cheyenne forms the common tribal suffix is *hétán* (root, *tan* or *tăn*), man or person, plural *hetáneo*. It is heard also as *hetăn*, *hitän*, or sometimes *qitan*. In the same way there is a constant shifting by individuals from *a* to *ä*, *e* to *i*, *ŏ* to *u*. *d*, *v*, and *w* represent, not the ordinary English sounds, but approximates. ' is evanescent and almost silent.

Cree. — *Wŏ́gó* (plural, *Wó'góhi*), 'Rabbits.'

Assiniboin. — *Ho'hé*[2] (*Ho'héeo*). Adapted from the Sioux name, although some attempt to give it a Cheyenne meaning. *Ho-hé-i-o* — Hayden.

Sarsi (?). — *Sasap* (*Sásăpán*). Adapted from some other tribe. Perhaps identical with the *Nótameo*, 'northern people'; indicated in the sign language by a sweeping rub of the thigh, the same sign

[2] *Missouri River Tribes*, 290.

used by the older Kiowa to designate both the Sarsi and the Brulé Sioux.

BLACKFOOT. — Old name, *Póomŭ'ts* (plural, *Póomăs*), 'gray, i. e. unpainted, robe, or blanket': *tsĭ'poo*, 'it is gray'; *hóomă*, 'robe.' Modern name, *Moqtávhatätä'n* (*Moqtávhatätä'n-éo*), 'blackfooted men.' The name does not contain the word for *foot*, but it is understood from the construction. Cf. *Flathead*. *Pó-o-mas*, 'blankets whitened with earth' — Hayden.

A. PIEGAN BLACKFOOT. — *Pégŭ'n* (plural, same), regarded as a subtribe of the Blackfeet, but usually called by the divisional name.

ATSINA, or ARAPAHO GROSVENTRES. — *Hĭstúitä'n* (*Hĭstúitä'n-eo*), 'people who ask (beg) for meat,' from *nahĭst'a't*, 'I ask for meat,' the equivalent of their Arapaho name, *Hitúněna*, 'Begging men.' *His-tu-i-ta-ni-o* alias *E-tá-ni-o*, 'people' — Hayden.

FLATHEAD. — *K'góistsiätän* (*K'góistsiätän-eo*), 'flattened-head people,' or, more strictly, 'people with heads compressed at the sides'; *k'agŭ'n*, 'thin or compressed.' The name does not contain the word for *head*, which is understood from the construction. Cf. *Blackfoot*. *Ka-kó-is-tsi-a-tá-ni-o*, 'people who flatten their heads' — Hayden.

NEZ PERCÉ. — *Otä'ĭs-hĭtä'n* (*Otä'ĭs-hĭtä'n-eo*), 'pierced-nose men,' from *o*, root of 'hole'; *tä'ĭs*, 'nose'; *hĭtä'n*, 'man.' When necessary to distinguish them from the Caddo, who are called by the same name, they prefix *notám*, 'north,' as *Notám-Otä'ĭs-hĭtän-eo*. Cf. *Caddo*.

BANNOCK. — *Bä'năki* (plural, same). Adapted.

SHOSHONI. — *Sósoni* (*Sósoni-éo*). Adapted. *Só-so-ni* or *Só-so-i-há-ni* — Hayden.

A. — *Moiéomĭnĭ'tan* (*Moiéomĭnĭ'tan-eo*), 'grass-house people,' from *móĭĭ*, 'grass,' and *nĭmĭ*, possessive of *vi'*, 'tipi.' A tribe apparently cognate with the Shoshoni, but farther northwest, beyond the mountains. The Kiowa sometimes call the Shoshoni 'Grass House People,' but Cheyenne authorities claim that the two tribes are distinct. Probably some of the so-called Snake bands of Idaho.

CROW. — Old name, *O'tä'n* (*O'tä'neo*), 'raven men,' or 'crow men,' from *ówŭt*, the large mountain raven, or *o'kóch*, crow. Modern name, *Oítän* (*Oítän-eo*), a corruption from the earlier form and incorrectly supposed to have reference to *óitä*, syphilis. *O-é-tun'-i-o* — Hayden. *Hóh-otann* — Maximilian.

MANDAN. — *Mévátän* (*Mévátan-éo*). Adapted from the Sioux

name *Mawatani*, although some Cheyenne try to interpret it from a Cheyenne word meaning 'eaters,' i. e., cannibals. A Cheyenne dance society, probably of Mandan origin, is called *Mévatanéo-sŭn. Wihwatann* [*W* probably misprint for *M*] — Maximilian.

HIDATSA or MINITARÍ. — *M'onón* (*M'onón-éo*). Identified as speaking the same language as the Crows. The name seems to mean 'spreading tipis,' from a word in common use to denote a tipi disproportionately wide at the base. The tribal sign also indicates *spreading tipis*, although sometimes incorrectly made and interpreted *tipis abreast, row of lodges*, or *tipis on a bluff*. The name may have some connection with *Onŏ'n*, Arikara. Hayden incorrectly gives *Mo-nó-ni-o* as the Mandan. *Honúhn* — Maximilian.

ARIKARA, REE. — *Onŏ'n* (*Onŏ'n-eo*); seems to refer to *shelling corn* with the teeth; *na ŏinĭn*, 'I am shelling it'; *ŏineo*, 'a threshing machine.' The tribal sign indicates gnawing corn from the cob. *O-nó-ni-o* — Hayden. *Óhnunnu* — Maximilian.

SIOUX. — *Hoóhomŏ'i* (*Hoóhomó-eo*); believed to be a Cheyenne word, but of doubtful etymology; *O-ó-ho-mo-i-o* — Hayden. *Ohohma* — Maximilian.

A. — Oglala Sioux, *Oganä'na*, adapted; *O-tŏ'q-sōn*, 'little stars' — Hayden.

B. — Brulé Sioux, *Wŭnhĭtŏ'na-ĭsts* (*Wŭ'nhĭtŏ'nahĭ's*; sometimes prefix *O*), 'burnt thigh,' from *hĭtón*, a particular muscle in the thigh; the word indicates that the whole surface is burnt. *Woni-tô-na-his* — Hayden.

C. — Blackfoot Sioux (Sihasapa), *Mōq-tá-wa-ta-tá-ni-o*, 'blackfeet people' — Hayden.

D. — Sans-arcs Sioux, *Má-i-sin-as*, 'no bows' — Hayden.

E. — Two Kettle Sioux, *Niq'-a-o-c'iq'-a-is*, 'two kettles' — Hayden.

F. — Shunka-yuteshin Sioux, Band that eats no dogs, *Ho-tum'-mí-hu-is* — Hayden.

G. — Eastern Sioux, *Ná'towŭ'n* (*Ná'towŭna*), apparently a derivation from the old Algonquian term *Natowe*, applied to tribes of Siouan or of other alien stock. The Cheyenne also called by this name the Winnebago met by them at the Omaha Exposition in 1898. *Na-to-wo-na* — Hayden.

OMAHA. — *Omáha* (*Omáhas*); adapted. They are also sometimes included with the Ponca, q.v., under the name, *Onĭ'hă°*, and this may have been the older designation.

PONCA. — *Oñi'hă'* (*Oñi'hă°*), said by some Cheyenne to refer to 'sitting down to beg,' from *na uñi''hăi*, 'I sit down begging,' from the Ponca and Omaha custom of making begging dance excursions to other tribes, in which it is the rule for the visitors to sit down on the ground at a distance from the camp until invited to enter. Other Cheyenne consider it a foreign word of unknown meaning, possibly a corruption of *Omaha*, both tribes being frequently included under the same names. Hayden has Omahas, *O-ni'-ha-o*, 'the drum beaters.'

CHEYENNE. — Dzítsĭstä's; see synonyms, page 361.

ARAPAHO. — *Hĭtäniwó*[1] (*Hĭtäniwó-éo*), 'sky or cloud people'; by some connected, but probably incorrectly, with *hidä'n*, 'teat,' to which the sign-language gesture for Northern Arapaho also refers. *I-tún-i-wo*, 'skymen' — Hayden. Their Sioux name is *Maqpiato*, 'blue cloud.'

A. — Northern Arapaho, *Wanuĭ'tän* (*Wanuĭ'tän-éo*), 'sage men,' from *wáneĭ*, 'wild sage.'

B. — Southern Arapaho, *Nómsĭn'na't* (*Nomsĭn'néo*), 'southerners,' from *nómhastŭ*, 'south.'

UTE. — *Moqtáw'-haitä'n* (*Moqtáw'-haitän-eo*), 'black people,' from *moqtaw'*, 'black.' The name is sometimes used as generic to include other Shoshonean tribes, as Bannock, Paiute, etc. They are considered by the Plains Indians to be darker than themselves. *Mōq-tau-hai-ta-ni-o*, 'black men' — Hayden.

PAIUTE. — *Wó'goi-womä'*[1] or *Wóhiwomä'*[1] (*Wó'goi-womä'heo* or *Wóhiwomä'heo*), 'rabbit blanket people,' from *wo'go'*[4] or *wóhĭ*, 'rabbit' (generic), and *womäi*, referring to a dress or covering. Despite the distance, the Cheyenne have made frequent visits to the Paiute since the inauguration of the Ghost Dance by a prophet of the latter tribe about twenty years ago.

A. — *Noman[i]o'méwŭts* (*Noman[i]o'méwas*), 'fish eaters,' a branch or subtribe of the Paiute, probably those of Pyramid Lake reservation, Nevada, as distinguished from those of Walker Lake reservation. Both bands call themselves *Agaĭ-tĭkára*, 'fish eaters,' as distinguished from the *Kotsó-tĭkára*, 'buffalo eaters,' the Bannock. The Cheyenne name is composed of *nóman*, 'fish,' and *o'méwas*, an irregular derivative for *namĭ'si*, 'I eat.'

PAWNEE. — *Ho'ni-hitä'n* (*Ho'ni-hitä'n-eo*), 'wolf people.' *Ho-ni-i-ta-ni-o*, 'little wolf people' — Hayden. *Hókni-tánn* — Maximilian. According to Petter, the old Cheyenne name for the Pawnee

was *Paoneneheo*, which might be interpreted 'people with projecting front teeth,' from *paonen*, 'projecting front teeth,' and *eheo*, the tribal suffix. It is probably, however, an inspiration from Panani, the Siouan name for the tribe.

OTO and MISSOURI. — *Masúhan* or *M'súhan* (*Masúhanán*). An adaptation of the name Missouri, applied by the Cheyenne to both confederated tribes. The Arapaho also call both tribes by a form of the same name, *Wăsúhăn*, *Wasúhănă*.

KAW, KANSA. — *Änäho* or *Änähó* (plural, same). An adaptation of an old name of unknown origin which appears as *Anahou* as far back as Joutel's narrative, 1687. The same name is used also by the Arapaho (*Ánahú*) and Kiowa (*Älähó*), but with constant confusion between Kansa and Quapaw, the two tribes being originally branches of the Osage, with the same language and hair-cut. With the Cheyenne it usually means the Kansa, with the Kiowa it more frequently means the Quapaw. See also *Osage*.

QUAPAW. — See *Kaw* and *Osage*.

OSAGE. — *Wasás* (*W'sásă'n*). Adapted. The Osage, Kaw, and Quapaw, speaking dialects of the same language and having their heads shaved and painted red, are also known indiscriminately as *Oóqt-qitä'n* (*O-óqt-qitä'n-eo*), 'shaved-head people', *Maóqt-qitä'n* (*Maóqt-qitä'n-eo*), 'red shaved people.' *Oóqt* may be rendered 'tonsure' and refers to hair cut in any special fashion, but does not contain the word for 'hair.' In this case, for the sake of euphony, *hitä'n* becomes *qitän*. The three tribes are hereditary enemies of the Cheyenne.

KIOWA. — *Wĭ'tăpătŭ'* (*Wĭ'tăpä'tu*). Adapted from the Sioux name, *Witapähä'tu*. *Wi-tup-á-tu* is incorrectly given by Hayden as meaning the Comanche.

COMANCHE. — *Shĭ'shĭnóătsitän* (*Shĭ'shĭnóătsitä'n-eo*), 'snake people,' from *shĭ'shĭnóat*, or *shĭshĭnoqts*, 'snake.' Hayden has *Shish-i-nú-wut-tsit-a-ni-o*, 'rattlesnake people,' incorrectly given as meaning the Kiowa.

KIOWA APACHE, LIPAN? } See Apache proper.

MESCALERO. — See *Apache*, or *Gohano*^{k}, under *Pueblo*.

JICARILLA. — *Notámĭ-mo'tséheúnitän* (*Notámĭ-mo'tséheúnitän-eo*), 'northern Apache,' from *notám* 'north.' See *Apache*.

NAVAHO. — *Năwahó* (plural, same). Adapted.

PUEBLO. — *Hotamóehĭtä'n* (*Hotamóehĭtän-eo*), *Hotamóchihĭ'tän*

(*Hotamóchihĭtă'n-eo*), or *Hotamóihe*^{k} (*Hotamóihehéo*), 'bunched hair people'; the name does not contain the word 'hair,' but indicates the folded and tied roll of hair. Also *Pŏowŏn* (*Pŏowŏnan*), apparently adapted from *Pueblo*.

A. — *Gha*^{k}*-hĭ'tän* (*Gha*^{k}*-hĭtän-eo*) 'ermine people,' from *ghă*^{k}, 'ermine.' A Pueblo people southward from Taos; described by Cheyenne visitors who had met them at Taos. The women wore their hair in two bunches like the Jicarilla women. The men had adapted the ordinary Plains hairdress, but said they formerly cut the hair below the ears, with short side plaits. Their moccasins were pointed and turned up at the toes and they spoke Spanish while at Taos. They are not the Navaho, Ute, Jicarilla, or Taos, but from the scant data Hodge thinks they may possibly be the Picuris. Hayden has: "*ka-he-ta-ni-o*, 'people with white ermines,' some people who accompanied the Spaniards to trade with the Cheyennes, and tied their hair with strips of white ermine skin."

B. — *Góhano*^{k} or *Wóhano*^{k} (plural, same). Possibly adapted from a Comanche name. A tribe sometimes visiting the Comanche, probably a Pueblo people or else the Mescaleros.

APACHE. — *Mó'tséheúnitän* (*Mó'tséheúnitän-eo*), the name properly refers to 'people using the rasp fiddle' common among the Southwestern tribes, but has been incorrectly rendered 'breeders', or 'people who gather around a remnant carcass,' from *mó'tséhe*, 'a carcass stripped of most of its meat.' The term is also used generically for any people of Apache kinship, as Kiowa Apache, Mescaleros, etc., excepting the Navaho.

CADDO. — *Otäĭsĭtän* (*Otä'ĭsĭ'täneo*), 'pierced-nose people.' The same name is applied to the Nez Percés, q. v., the distinction being made, when necessary, by prefixing *north* or *south*.

WICHITA, etc. — *Hew'soitän* (*Hew'sóitäneo*), 'tattooed people.'

TONKAWA. — *Miváfwi* (*Mivafw'éo*), 'cannibals'; from *miv*, the root of another word signifying 'to eat,' the common word being *namĭ'sĭ*, 'I eat.'

SAUK (immigrant). — *Sá'kots* (plural, same). Adapted.

KICKAPOO (immigrant). — *Chĭ'kápŭ'* (*Chĭkápŭ'n*). Adapted.

WINNEBAGO (immigrant). — See *Ná'towŭn*, under Sioux.

SHAWNEE (immigrant). — *Sáwăn*^{ă} (*Sáwanéo*, *Sáwănă*). Adapted. The Delawares are perhaps included under the same name.

CHEROKEE (immigrant). — *Sä'năki* (*Sä'năkiwo*) or *Sä'nächi* (*Sänächiwo*). Adapted.

CHOCTAW (immigrant). — *Sáqta*^{i} (plural, same). Adapted.

HĬSTĂ'SIWŬSTĂN (*Histäsiwŭstän-eo*). — 'Snow people,' from *hĭ'stäs*, 'snow,' a collective term for the tribes of the far North.

SŬ'TAI (Sŭtaí-o). — An incorporated Algonquian tribe.

MŎS, MÓĬS (Mŏ'seo, Móĭseo). — A traditional friendly Algonquian tribe east of Missouri river: the Monsoni of Rainy lake and Moose river.

ÓWŬ'Q (Ówŭ'qeo). — A traditional tribe exterminated by the Cheyenne west of Missouri river: possibly the Amaqawi, an incorporated remnant tribe formerly living with the Hidatsa.

WHITE MAN, particularly American, *Viho*^{i} (*Vihó*^{i}). A name of very doubtful etymology. The most common and plausible explanation derives it from a root meaning *sacked, covered, inclosed*, apparently referring to the dress of the white man as contrasted with the nakedness of the oldtime Indian; *viho*^{i}, inclosed in a sack; *vihosiyu*, a parflèche box or envelope; *vihoĭstŭts*, a coffin. The same name, *viho*^{i}, is also given to certain species of spiders which line their dens with web and carry their young in a bag upon the back, hence it is sometimes carelessly said that the Cheyenne name for "white man" means "spider." In Arapaho also the same word is used for "white man" and "spider", but apparently from a root meaning 'skilful' or 'cunning.'

NEGRO. — *Moqtaí-viho*^{i} (*Moqtaí-vihó*^{i}), 'black white-man.'

CHINAMAN. — *Hotamŏ'tsĭnhŏ*^{i} (*Hotamŏ'tsĭnhóheo*), 'people with hair braided behind,' also sometimes *Nĭshihănĭnihĭ* (*Nĭshihănĭnĭ'heo*), 'washers,' from *nänᶜshihänin*, 'I wash.'

MEXICAN, SPANIARD. — *Mĭ'shisĭ'-viho*^{i}, 'hairy nostril white man,' i. e., 'whiskered white man,' from *mĭ'shis* 'whiskers,' also *Mĭshgóinĭ'hio*^{i}, conveying about the same meaning. As a personal name it becomes *Mĭshgó*^{i}. *Mish-i-sí-wi-o*, 'people with hairy noses' — Hayden. The sign is made by rubbing the lower part of the face several times to indicate the beard.

TEXAN. — *Dohánoi* (*Dohanó*^{i}). Adapted from the Spanish *Tejano*. For historical reasons the southern tribes regard the Texans as distinct from the people of the United States, usually designating them by some corruption of *Tejano*.

FRENCHMAN. — *Papsíhi-viho*^{i}. The last part is the ordinary word for 'white man'; the meaning of the first part is uncertain, but it is claimed by some to be a mockery of the rapid speech of the old French frontiersmen. The word is still used as a nickname by children at play.

OTHER FOREIGNERS. — *Má-i-viho*^{k} (*Má-i-vihô*^{k}), 'red white-men'; used generally for Irish, Germans, and all other whites of peculiar speech not included under preceding classifications. Hayden has "*Ma-wi-o*, 'red bodied people,' Mormons."

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"With the assistance of Mr. Smith [John S. Smith, *q. v.*], who trades for the fort, and who speaks the Cheyenne [*sic*] language better, perhaps, than any other white man in the country, I made notes of everything that my red friends communicated. . . . From this day forth I spent several hours in the daily study of this language, and had succeeded in forming an elementary grammar; but on my winter journey back to St. Louis, in December and February, these papers were lost." It was from this vocabulary that Latham and Gallatin identified the language as Algonquian.

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A valuable series of papers of personal recollections treating the Chivington massacre, Platte Bridge, Powder river, and Hancock expeditions, Kidder massacre, Arickaree fork, Beaver creek, and the Washita, Carr's fight near Summit Springs, and the Custer massacre, from the Indian point of view. Both the articles and the magazine seem to come to an end with the number for March, 1906.

George Bent, the son of Col. William Bent by his Cheyenne wife, was born in Bent's Fort in 1842. In 1856 he was sent by his father to a private school in St Louis, where he remained until the outbreak of the Civil War, when he enlisted in the Confederate cavalry service, and was present at the battles of Wilson's Creek, Lexington, Pea Ridge, and Corinth. Being soon afterward captured while on a scouting expedition, he was released on parole through the effort of friends of his father. Returning to Colorado, he rejoined the Cheyenne and was present, on the Indian side, at the Chivington massacre, Platte Bridge fight, and other frontier engagements of that period. He afterward rendered important service in connection with the Medicine Lodge treaty and other Indian negotiations, and later acted for some years as Government agency interpreter at Darlington. His knowledge of Indian life is very intimate, and his personal acquaintance has included almost every prominent frontier officer and Indian leader of the last generation. He now resides on his ranch near Bridgeport, Okla.

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—— See also SMET.

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As stated by Mr Clark to the present writer in 1891 (see Pilling, *Algonq. Bibliog.*, 557), this work was prepared at the request of General Sheridan, who intended to have it published by the War Department. General Sheridan dying, this was not done, and the manuscript was finally acquired by Dr George Bird Grinnell of New York. According to Mr Clark, it is divided as follows: Ethnography, 44 pages; Philology, 9 pages; Local Names, 22 pages; Grammar, 28 pages; English-Cheyenne dictionary, 185 pages; Cheyenne-English dictionary, 180 pages. In the literary construction and arrangement the author had the assistance of an officer at Fort Reno, Okla.

A complete bound typewritten copy of this manuscript, made under the supervision of the late Prof. E. N. Horsford and by him presented to Wellesley College, Wellesley, Mass., is now in possession of that institution, being catalogued under the title of "Cheyenne History and Dictionary." The accompanying instructions to the printer by Clark bear date of March 1, 1887. A typewritten copy of the "Ethnography" and "Local Names," being pages 1–37 and 251–263 from the Wellesley manuscript, is now in possession of the Bureau of American Ethnology.

Benjamin Clark, government scout and interpreter, was born in St Louis, Mo., Feb. 2, 1841. When a mere boy, in the summer of 1857, he joined the noted expedition under command of Gen. Albert Sidney Johnston, which crossed the plains to Salt Lake City to impress upon the Mormons the authority of the U. S. Government. While passing near Ash Hollow, Nebr., on the North Platte, the Cheyenne attacked the wagon train of his division, killing three men, this being his first introduction to the Cheyenne tribe. On reaching Fort Bridger, Wyo., in November of that year, the freighting party of 400 men to which Clark was attached was regularly mustered in as a volunteer battalion, since which time he has been continuously on the army roll. He remained with the expedition in Utah until the spring of 1861, when he was assigned to scouting duty on the plains with the troops afterward making headquarters chiefly at Fort Dodge and Fort Supply. In 1868 he was in com-

mand of scouts at the battle of the Washita and was instrumental in saving the lives of a party of fugitive Cheyenne women, one of whom, a young girl, soon after became his wife. She died in 1875 and was buried at Fort Supply. Since about 1870 he has been official post interpreter for the Cheyenne, first at Fort Supply and since 1876 at Fort Reno, Oklahoma, where he still resides. In this capacity he has several times had official charge of Indian delegations to Washington or Chicago. In the summer of 1878, under detail from the War Department, he escorted a delegation of friendly Nez Percés from Fort Leavenworth to Sitting Bull's camp of hostiles on the South Saskatchewan in British America for the purpose of arranging terms of surrender with the refugee Nez Percés, who had crossed the border. Later in the same year, under orders from General Sheridan, he conducted a party of nearly 200 surrendered Northern Cheyenne from Fort Keogh, Montana, via Bismarck and Sidney, to Fort Reno, Oklahoma, where the greater portion of the tribe was then quartered; while this move was in progress some 335 of the late hostile Cheyenne under Dull Knife broke away from the southern agency in a desperate effort to escape to the north, killing more than forty white settlers as they crossed Kansas directly in the line of Clark's party and pursued by several regiments of Government troops; but he was able to halt and hold his own prisoners in a secure position, keeping them in ignorance of what was transpiring until they were finally landed safely at Fort Reno.

In 1879 he married his present Cheyenne wife. In 1883–85, on request of General Sheridan, who was deeply interested in the Indians and had a high regard for Mr Clark, he prepared his "Ethnography and Philology of the Cheyenne," for publication under the auspices of the War Department. Owing to the untimely death of Sheridan in 1888, it still remains in manuscript. His latest exploit was performed in the fall of 1905 as guide to a detachment of U. S. troops on a fatiguing practice march across country by way of the old trails, from Fort Riley, Kans., to Fort Sam Houston, Tex., a distance of about 800 miles, during which period, in spite of his sixty-five years, he spent each day in the saddle, cooking his own meals, fording every river on horseback, and sleeping in the open air at night. In manner and appearance Mr Clark is a typical frontier scout of the olden type, erect and soldierly in bearing, modest, direct, and courteous in expression, and with a knowledge of Cheyenne things possessed by no other white man.

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Described in Pilling's *Algonquian Bibliography*, p. 663, as "MS., 10 unnumbered leaves, small 4to, in the library of the Bureau of Ethnology." It seems to have disappeared.

—— Words, Phrases, and Sentences in the Language of the Cheyenne of Pine Ridge Agency, S. D. Recorded February, 1891. MS. in collection of the Bureau of American Ethnology.

In a copy of Powell's *Introduction to the Study of Indian Languages*, 2d ed., 4°, of which it occupies pages 77–228 and 9 unnumbered leaves. Besides the regular schedules it contains conjugations, tribal names, several songs, and valuable notes on medicine practices. In his note upon this, Pilling, *Algong. Bibliog.*, p. 563, has: "In two smaller blank-books, respectively 34 and 60 pages, small 4°, Mr Gatschet has recorded from the same source much linguistic information not called for in the Introduction." The smaller one of these is taken up chiefly with an explanation of the larger pictures noted below. The other seems to have disappeared.

—— Crayon Pictures of Cheyenne Ceremonial Customs and Implements. Drawn by Wuqpais, or Daniel Littlechief, son of the present headchief of the Cheyenne Indians of South Dakota. at Pine Ridge Agency. Explained by notes obtained from the same Indian, Washington, February, 1891. MS. in collection of the Bureau of American Ethnology.

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Interesting notes on the Cheyenne as met in 1800 and 1806, with earliest hint of Algonquian affinity.

Indian Affairs. Annual Reports of the Department of the Interior for the fiscal year ended June 30, 1905. Indian Affairs, Part I, Report of the Commissioner, and Appendixes. Washington, 1906.

The Office of Indian Affairs was regularly organized in 1834, the earlier reports on Indian affairs, beginning in 1821, having constituted only a few pages each of the War Department reports. The first incidental notice of the Cheyenne occurs in the Report of the Commissioner of Indian Affairs for 1835.

Indian Miscellany. Smithsonian Institution. Bureau of American Ethnology. Indian Miscellany. Quarto series. Washington. Library of the Bureau of American Ethnology.

A collection of newspaper clippings, etc., relating to the Indians, covering dates from 1726 to 1868, and mounted in chronologic order in 10 quarto scrapbooks. The later volumes contain contemporary notices of border campaigns, treaties, etc., in which the Cheyenne were concerned.

Irving, John T., *Jr.* Indian Sketches, taken during an Expedition to the Pawnee Tribes. 2 volumes. Philadelphia, 1835.

"The juvenile excursion of a minor" (1833). Vol. II, chapter "The Shian Captive," contains an account of the killing of a Cheyenne girl destined for a Pawnee sacrifice.

Irving, Washington. Astoria, or Anecdotes of an Enterprise beyond the Rocky Mountains. Tacoma edition, 2 volumes. New York and London, 1897.

Originally published in 1836. Contains notes of the sojourn of Hunt's overland Astoria expedition of 1811 with the Cheyenne in the Black-hills country. See also *Bradbury*.

Jackson, Helen Hunt ("H. H."). A Century of Dishonor: A Sketch of the U. S. Government's Dealings with some of the Indian Tribes. New York [1881].

Contains a chapter on the Cheyenne, including notice of the Chivington massacre, etc., with statistics of condition in 1880.

Jackson, W. H. Descriptive Catalogue of Photographs of North American Indians, by W. H. Jackson, Photographer of the Survey. U. S. Geological Survey of the Territories, *Miscellaneous Publication No. 9*, Washington, 1877.

Contains 1-page tribal sketch accompanying list of 22 portraits of Southern Cheyenne, of which negatives are now in possession of the Bureau of American Ethnology.

James, Edwin. Account of an Expedition from Pittsburgh to the Rocky Mountains performed in the years 1819 and 1820 . . . under the command of Major Stephen H. Long. ("Long's Expedition.") Two volumes, Philadelphia, 1823.

Brief references in vol. II. to "Shiennes" met on Arkansas river.

Jenness, George B. The Battle on Beaver Creek. In *Trans. Kansas State Hist. Soc.*, 1905-06, IX, 443-52, Topeka, 1906.

Major G. A. Armes against the Cheyenne and Arapaho, August, 1867.

Jomard, Edme F. Langue des Indiens Cheyennes. In *Bulletin de la Société de Géographie*, 3d ser., VI, Paris, 1846.

Two pages (384-86) of comment on vocabulary given by Abert (*q. v.*), with 23 of his numerals. According to Pilling (*Algonq. Bibliog.*, p. 264), the same comment was reprinted by Jomard in his "Note sur les Botecudos," reprinted from the same journal for the same year.

Kansas State Historical Society. See BEECHER INDIAN MONUMENT; BERNARD, W. R.; FAIRFIELD, S. H.; FREEMAN, W.; JENNESS, G. B.; LOWE, P. G.; MCNEAL, J. W.; MEAD, J. R.; MOORE, H. L.; MOREHOUSE, G. P.; PECK, R. M.; PHILLIPS, W. A.; REES, D. S.; ROENIGK, A.; SMITH, P. F.; SUMNER, E. V.; WILSON, H. P.; WRIGHT, R. M.

Kappler, Charles J. Indian Affairs: Laws and Treaties. Compiled and edited by Charles J. Kappler, clerk to the Senate Committee on Indian Affairs. Vol. I, Laws. Vol. II, Treaties. Washington, 1904.

ten Kate, *Dr* H. C. F., *jr.* Sur la Synonymie Ethnique et la Toponymie chez les Indiens de l'Amérique du Nord. Separate, pp. 353-363, from *Verslagen en Mededeelingen der Koninklijke Akademie van Vetenschappen*, Amsterdam, 1884.

Cheyenne synonyms for neighboring tribes and *vice versa*.

—— Reizen en Onderzoekingen in Noord-Amerika. Leiden, 1885.

Contains an interesting account of the condition of the (Southern) Cheyenne in 1881-82, with notes on their history from the time of the Chivington massacre.

Keim, DeB. R. Sheridan's Troopers on the Borders: A Winter Campaign on the Plains. Philadelphia, 1885.

Interesting sketches, somewhat exaggerated, of the border campaigns of 1868, including Arickaree fork and the Washita. The author accompanied the latter expedition. The book was written in 1870.

Kroeber, A. L. Cheyenne Tales. In *Journal of American Folk-lore*, XIII, 30 pp., Boston, 1900.

La Salle, Cavelier de. [Letter of 1680 — beginning and date missing — evidently written as a report to date on his return to Canada from the Illinois country. Contains first historic notice of the Cheyenne.] In Margry, *Découvertes et Établissements des Français*, etc., II, Paris, 1877.

Latham, Robert G. On the Shyenne Numerals. (Abstract.) In *Report of the Seventeenth Meeting of the British Association for the Advancement of Science, held at Oxford in June, 1847*, Transactions of the Sections, p. 123, London, 1848.

"In Gallatin's Synopsis doubts are expressed as to the proper place of the Shyenne language. Lieutenant Abert, of the Santa Fé Expedition, as stated in the 'Bulletin de la Société de Géographie,' has published a grammar and vocabulary of this language. The numerals alone have been seen by the

writer of this note. They refer the language to the Algonquin group of tongues."

This seems to be the first public announcement of the Algonquian affinity of the Cheyenne language, preceding the more detailed statement of Gallatin by several months, although both statements first appeared in print in the same year, 1848, within a year of Abert's return from the field. In his *Varieties of Man* (1850) and *Opuscula* (1860) Latham also refers to his Oxford paper. In *Opuscula* (p. 330) he says: "A vocabulary of Lieut. Abert's settled this. The numerals of this were published earlier than the other words, and on these the present writer remarked that they were Algonkin (Report of the British Association for the Advancement of Science, 1847—Transactions of the Sections, p. 123). Meanwhile the full vocabulary, which was in the hands of Gallatin and collated by him, gave the contemplated result."

—— The Natural History of the Varieties of Man. London, 1850.

Discussion of Cheyenne migrations and affinities, pp. 329–32.

—— On the Languages of Northern, Western, and Central America. In *Transactions of the Philological Society*, 1857, pp. 57–115, London, 1857 [?].

This is the same paper which appears later in his *Opuscula*, and contains 3 pp. (61–63) of Cheyenne notice, with vocabulary of 23 words compared with Arapaho.

—— Opuscula: Essays chiefly Philological and Ethnographical. London, 1860.

A collection of previous separate papers. Pp. 326–77 contain the same paper noted under "On the Languages," above, the Cheyenne portion occupying pp. 329–31.

—— Elements of Comparative Philology. London, 1862.

On pp. 455–58 is a repetition, with a few verbal changes, of the Cheyenne notes and vocabulary in the third and fourth titles above.

Lewis *and* **Clark.** [This classic of the West has passed through nearly forty editions, either in whole or in part, of which the most important are the first and last, as noted below:]

Message from the President of United States communicating Discoveries made in Exploring the Missouri, Red River, and Washita, by Captains Lewis and Clark, Doctor Sibley and Mr. Dunbar; with a statistical account of the Countries adjacent. February 19, 1806. Read, and ordered to lie on the table. City of Washington: A. and G. Way, printers, 1806 (pp. 167 + 7).

—— Original Journals of the Lewis and Clark Expedition, 1804–1806. Printed from the original manuscripts . . . together with Manuscript Material of Lewis and Clark from other sources . . . now for the first time published in full and exactly as written. Edited, with Introduction, Notes, and Index, by Reuben Gold Thwaites, LL.D. 8 volumes. New York: Dodd, Mead, and Company, 1904–05.

This last is a magnificent series, worthy of the editor's previous work, the *Jesuit Relations*. Volume 8 is made up of the original maps of the route. The narrative contains the account of the first contact of the Cheyenne with U. S. officers in 1804 and 1806, with statistics of the population and condition of the Cheyenne, Staetan (Sutaio?), and Canenavich (Arapaho).

Linscheid, *Rev.* **G. A.** Cheyenne Sermons. MSS., 1906.

A series of manuscript sermons in the Cheyenne language, eighty in number to date, February 4, 1907. List of titles furnished by the author, Mennonite missionary to the Northern Cheyenne, Bethany mission, Busby, Montana.

Gustav A. Linscheid was born in Galicia, Austria, Nov. 4, 1875, and came to the United States in the spring of 1883. After some years' attendance at Bethel College, Newton, Kan., he entered the Mennonite mission service in 1895 as principal teacher in the Southern Cheyenne mission school at Cantonment, Okla. Three years later he reentered Bethel to complete his studies, and, after graduating from the academic course in 1900, resumed work as regular missionary in the tribe, being ordained to the ministry in the same year. In September, 1903, he was united in marriage to Miss Anna Hirschler, who has been his devoted collaborator in all his later work. In 1904, being assigned to labor among the Northern Cheyenne, he established

near Busby, Mont., the Bethany mission, of which he is now in charge.

Long, Stephen H. See JAMES, EDWIN.

Lowe, Percival G. Kansas, as seen in the Indian Territory. In *Transactions of the Kansas State Historical Society*, IV, p. 6, Topeka, 1890.

Notices of Cheyenne, Arapaho, Pawnee, etc., Fitzpatrick, and others, about 1850.

Mallery, *Col.* Garrick. Pictographs of the North American Indians. In *Fourth Annual Report of the Bureau of Ethnology* (for 1882–83), pp. 3–256, Washington, 1886.

Numerous references to wars of the Sioux against Cheyenne and Arapaho up to the peace of 1840–41.

Margry, Pierre. Découvertes et Établissements des Français dans l'ouest et dans le sud de l'Amérique Septentrionale (1614–1754). Mémoires et Documents Originaux recueillis et publiés par Pierre Margry. (6 volumes, 1875–1886.) Deuxième Partie. Lettres de Cavelier de la Salle, 1678–1685. Paris, 1877.

Contains what seems to be the first historic notice of the Cheyenne, 1680 (La Salle, vol. II); notices of the Monsoni, or Moiseo, and of the Verendrye expedition (vol. VI).

Maximilian, Prinz zu Wied-Neuwied. Reise in das Innere Nord-America in den Jahren 1832 bis 1834 von Maximilian Prinz zu Wied. Two volumes. Coblenz, 1839–1841.

One of the earliest and most valuable works dealing with the tribes and languages of the Missouri river and northern plains. It contains incidental references to the migrations and wars of the Cheyenne, living then on upper Cheyenne river, S. Dak., but not met; several synonyms, and a vocabulary of 67 Cheyenne words (II, 487–89), including several tribal names, the earliest vocabulary of the language published. A 3-volume Paris edition, 1840–43, contains abridgments from the various vocabularies of the Coblenz edition. A London edition, 1843, omits the linguistics.

McNeal, J. W. Letter on Sand Creek, Kansas, Fight in Dull Knife Raid, 1878. In *Trans. Kansas State Hist. Soc.*, 1905–06, IX, pp. 388–89, Topeka, 1906.

Mead, James R. The Saline River Country in 1859. In *Trans. Kansas State Hist. Soc.*, 1905–06, IX, pp. 8–19, Topeka, 1906.

Notes on Cheyenne encounters, and Cheyenne-Oto fight, 1861.

Miles, *Gen.* Nelson A. Personal Recollections and Observations . . . Embracing a Brief View of the Civil War . . . and the Story of his Indian Campaigns, etc. Chicago and New York, 1896.

Mooney, James. Cheyenne Notes. MS. in the collection of the Bureau of American Ethnology. 1891–1906.

Notes on organization, ceremonial, heraldry, history, technology, games, botany, geography, etc., covering a range of fifteen years of field investigation, but chiefly collected in 1902–06.

—— The Ghost Dance Religion and the Sioux Outbreak in 1890. Forms Pt. II of *Fourteenth Annual Report of the Bureau of Ethnology*, Washington, 1896.

Special chapter on the Cheyenne, with synonymy, divisions, camp-circle diagram, nineteen Ghost Dance songs and translations, and song glossary. Material collected in 1891.

—— Calendar History of the Kiowa Indians. Forms pages 131–468 of Pt. II of *Seventeenth Annual Report of the Bureau of American Ethnology*, Washington, 1898.

Much information concerning relations of Cheyenne with Kiowa and other Plains tribes, border wars, treaties, epidemics, etc.

Moore, Horace L. The Nineteenth Kansas Cavalry. In *Transactions of the Kansas State Historical Society*, VI, 17 pp., Topeka, 1900.

Operations against Cheyenne, etc., in winter of 1868–69, including Battle of Washita and seizure of Cheyenne chiefs by Custer. The writer was colonel of the Kansas regiment.

Morehouse, George P. Along the Kaw Trail. In *Trans. Kansas State Hist. Soc.*, 1903–04, VIII, pp. 206–12, Topeka, 1904.

Indian trails in Kansas, and notes on Little Robe's raid on the Kaws in 1868.

Morgan, Lewis H. Systems of Consanguinity and Affinity of the Human Family. *Smithsonian Contributions to Knowledge*, XVII, Washington, 1871.

Remarks on the Cheyenne tribe, with comparison of 16 words of Smith's vocabulary, pp. 213–215; system and terms of kinship, obtained in 1860 from Joseph Tesson, a mixed-blood French trader among the Cheyenne, pp. 291–382.

Morse, *Rev.* **Jedidiah.** A Report to the Secretary of War of the United States on Indian Affairs, comprising a narrative of a Tour performed in the summer of 1820, under a commission from the President of the United States, etc. New Haven, 1822.

Cheyenne statistics, app., 251, 254, 366.

Murray, Charles A. Travels in North America during the years 1834, 1835, and 1836. In 2 volumes. London, 1839.

Volume I has incidental references to the Cheyenne in 1834.

Palmer, *Capt.* **H. E.** History of the Powder River Expedition of 1865. In *Transactions and Reports of the Nebraska State Historical Society*, II, pp. 197–229, Lincoln, 1887.

Notes of Little Blue raid, Chivington massacre, Julesburg fight, and Powder River campaign.

Peace Commission. Report to the President by the Indian Peace Commission, January 7, 1868. In *Report of the Commissioner of Indian Affairs* for 1868, pp. 26–50, Washington, 1868.

A review of the work of the Commission appointed to negotiate treaties with the Plains tribes in 1867–68, with "the story of the Cheyennes" in their relations with the whites from 1851 to date, making a strong presentation for the Indians. The report is signed by Indian Commissioner Taylor as president, (Senator) J. B. Henderson, S. F. Tappan, and Generals Sherman, Harney, Sanborn, Terry, and Augur.

Peck, Robert M. Recollections of Early Times in Kansas Territory. In *Trans. Kansas State Hist. Soc.*, 1903–04, VIII, pp. 484–507, Topeka, 1904.

Notes on Bent's Fort, and Sumner's fight with the Cheyenne in 1857.

Perrin du Lac, F. M. Voyage dans les deux Louisianes, et chez les Nations Sauvages du Missouri . . . en 1801, 1802, and 1803. Paris, 1805.

Interesting notes on the Cheyenne as met in 1802, two years before encountered by Lewis and Clark, together with a considerable myth.

Petter, *Rev.* **Rodolphe.** Zistxuisto: or Cheyenne Reading Book. Quakertown, Pa.; U. S. Stauffer, printer, 1895. Paper, 36 pp.

The first book printed in the Cheyenne language. It contains an introduction, the alphabet, with explanation of sounds, several pages of vocabulary, and a number of sentences and Bible translations.

—— Pavosto Zeoxchesenitotahoez Luke na John [etc.]. The Gospels of Luke and John. Printed for the interest of the Mennonite Mission among the Cheyenne Indians. Berne, Ind.: Witness print, F. Rohrer, 1902. Cloth, pp. 240.

—— Assetosemeheo Heoxovistavatoz [etc.]. The Pilgrim's Progress, and some Bible Portions. Printed for the interest of the Mennonite Mission among the Cheyenne Indians. N. p., n. d., 264 pp. [Berne, Ind.: F. Rohrer, 1904.]

Pilgrim's Progress, Bible translations, and eight hymns.

—— Three Cheyenne Tales. Cheyenne and English interlinear translation. MS., 14 pp.

—— Cheyenne Sermons and Bible Translations. Disconnected MSS., aggregating about 400 pages.

—— Cheyenne Grammar. MS., 100 pp.

—— Cheyenne-English Dictionary. MS. In 2 parts: Cheyenne-English, 393 pp.; English-Cheyenne, 285 pp.

"Both dictionaries are now under revision and will be materially increased." — Letter of author, July, 1906. Three additional MS. copies of this dictionary have been made for their own use by other Mennonite missionaries now working among the Cheyenne, viz, Rev. J. H. Kliewer, Rev. G. A. Linscheid and Miss Agnes Williams, and Miss Bertha Kinsinger.

—— Zesse-nemeoxtoz (Cheyenne Songs). Printed in the interest of the Mennonite Mission. Berne, Ind., 1907.

A pamphlet of 30 pages containing 31 hymns, entirely in the Cheyenne language.

—— Sketch of the Cheyenne Grammar. *Memoirs of the American Anthropological Association*, vol. I, no. 6. Lancaster, Pa., 1907. [Accompanying paper.]

The Reverend Rodolphe Petter, our best authority on the Cheyenne language, is a native of the same country which gave Gallatin and Gatschet to American philology, having been born in Vevey, Canton Vaud, Switzerland, Feb. 19, 1865. In 1883 he entered the Evangelical Mission House at Basel to study theology and prepare for the duties of a missionary. Having completed the course, including languages and medicine, he was ordained in 1890, and in the summer of the same year embarked for America with his young wife to engage in Indian mission work under the auspices of the Mennonite Church. After six months together at Oberlin College, Ohio, for the purpose of learning English, Mr and Mrs Petter, in August, 1891, proceeded to Cantonment, Okla., the subagency headquarters of the most conservative element of the Cheyenne tribe, with whom they have ever since resided. By diligent application to the study of the Cheyenne language Mr Petter has so mastered it that for years he has used it exclusively in his daily work and contact with the Indians, as do also his wife and children. In addition to the scholarly training by which he is able to write, converse, and preach with almost equal fluency in French, German, English, and Cheyenne, it may be safely asserted that no other white man who has ever come to the Cheyenne has commanded more of their respect and affection. His principal assistant in the study of the language and the preparation of the translations has been Mr Harvey Whiteshield, an educated full-blood of the tribe.

Phillips, *Col.* W. A. Kansas History. Presidential Address, 1890. In *Transactions of the Kansas State Historical Society*, IV, 8 pp., Topeka, 1890.

Contains a picturesque description of a great Cheyenne camp on Saline river in 1859.

Pilling, James C. Bibliography of the Algonquian languages. *Bulletin* [13] *of the Bureau of Ethnology*. Washington, 1891.

Contains an exhaustive listing of all Cheyenne linguistic material — original publication, reprint, and manuscript — of which the author could obtain information up to June 1, 1891.

Pott, Friedrich August. Die Sprachverschiedenheit in Europa an den Zahlwörtern nachgewiesen [etc.]. Halle, 1868, 109 pp.

Notes on Cheyenne numerals, based on Gallatin's Abert vocabulary in *Trans. Am. Ethnol. Soc.*, II, 1848.

—— Die Personennamen, insbesondere die Familiennamen und ihre Entstehungsarten: auch unter Berücksichtigung der Ortsnamen. Leipzig, 1853.

Incidental notice of two Cheyenne words, p. 681. The title-page has August Friedrich, instead of *vice versa*.

—— Doppelung (Reduplikation, Gemination) als eines der wichtigsten Bildungsmittel der Sprache, beleuchtet aus Sprachen aller Welttheile. Lemgo and Detmold, 1862.

Cheyenne word examples, pp. 37 and 54. Title from Pilling.

Rees, D. S. An Indian Fight on the Solomon. In *Transactions of the Kansas State Historical Society*, VII, 2 pp., Topeka, 1902.

Fight between Delawares and Cheyenne in 1863.

Robinson, DeL. W. Cheyenne Indians. In *South Dakota Historical Collections*, I, pp. 146–47, Aberdeen, S. Dak., 1902.

A valuable 2-page note summary of their migrations and later history.

Robinson, Doane. A History of the Dakota or Sioux Indians. In *South Dakota Historical Collections*, II, Aberdeen, S. Dak., 1904.

Constitutes 523 pp. of the volume, special pagination. The chapters on the Custer war of 1876 and succeeding treaty, and the outbreak of 1890–91, contain Cheyenne references.

Roenigk, A. Railroad Grading among Indians. In *Trans. Kansas State Hist. Soc.*, 1903–04, VIII, pp. 384–89, Topeka, 1904.

Railroad building under difficulties in Kansas in 1868, by one of the workers.

Royce, Charles C. Indian Land Cessions in the United States, with an Introduction by Cyrus Thomas. Forms Part II of *Eighteenth Annual Report of the Bureau of American Ethnology*, Washington, 1899.

Summaries of all treaty land provisions and cessions, with explanations and maps.

[**Sage, R. B.**] Scenes in the Rocky Mountains and in Oregon, California, New Mexico, Texas, and the Grand Prairies [etc.]. By a New Englander. Philadelphia, 1846.

Numerous notices of the Cheyenne, Arapaho, and other tribes as met in 1841–43.

Sanford, *Rev.* **D. A.** Cheyenne Service Book. 20 pp. Shawnee, Oklahoma: Churchman Press, 1900.

The Creed, Lord's Prayer, Commandments, etc., 9 hymns, and 3 pp. of vocabulary (besides an additional hymn pasted inside back cover). The author was for some time Episcopal missionary among the Cheyenne, at Bridgeport, Okla.

Schoolcraft, Henry R. Information respecting the History, Condition, and Prospects of the Indian Tribes of the United States [etc.]. Published by authority of Congress. 6 volumes. Philadelphia, 1851–56.

Scattered through the six great volumes of this work are a number of things relating to the Cheyenne, the most important being probably the vocabulary by John S. Smith (*q. v.*).

Secretary of War. Expedition up the Missouri: Letter from the Secretary of War . . . respecting the Movements of the Expedition which lately ascended the Missouri River [etc.]. H. R. Doc. 117 (War Department), 19th Cong., 1st Sess., Washington, 1826.

Account, with statistics, of expedition to upper Missouri, May–Oct., 1825, under General Atkinson and Major O'Fallon, who negotiated the first treaties with the Cheyenne and other tribes of that region.

de Smet, *Rev.* **Peter J.** Letters and Sketches, with a Narrative of a Year's Residence among the Indian Tribes of the Rocky Mountains. Philadelphia, 1843.

Notes of friendly meetings with Cheyenne on the upper Platte in 1840. Pp. 32–3, 128–9, 134.

—— Cinquante Nouvelles Lettres du R. P. de Smet, de la Compagnie de Jésus [etc.], publiées par Ed. Terwecosen, de la même Compagnie. Paris, 1858.

Title from Pilling. Contains "names of Shyenne delegates with English synonyms."

—— Voyage au grand-désert en 1851 [etc.]. Bruxelles, 1853.

Title from Pilling. Contains "names of Sheyenne and Rapaho delegates, with French definitions, p. 60."

—— Western Missions and Missionaries: a series of letters. New York, 1863. Also later editions.

Titles from Pilling. Contains "names of Sheyenne and Rapaho delegates, with English definitions," p. 116.

—— Lettres choisies du révérend père Pierre-Jean de Smet [etc.]. Bruxelles and Paris, 1875.

Title from Pilling. Same names as noted in the third and fourth titles above.

—— See also CHITTENDEN and RICHARDSON.

Rev. Peter John de Smet, the noted Jesuit missionary to the tribes of the northern plains and Rocky mountains, was born in Termonde, Belgium, December 31, 1801. He came to America as a volunteer missionary in 1821, and after finishing his novitiate and assisting in the establishment of the University of St Louis, in which he was for a time a professor, he began his first mission among the Potawatomi in 1838. In consequence of his notable success in this work, he received permission from his superior to extend his efforts to the more remote tribes of the mountains. In 1840 he set out from St Louis for the Flatheads in western Montana, where he soon afterward established the mission which has resulted in the evangelization of the whole tribe. He then sailed for Europe for reinforcements, returning with a number of Jesuits and sisters by whose aid he inaugurated a series of missions among the tribes of the upper Columbia region, even to the North Saskatchewan. His missionary labor, covering thousands of miles of territory occupied by the wildest tribes, extended over a period of more than thirty years. On account of their influence with the Indians both he and the Episcopalian missionary, Rev. S. D. Hinman, were called to assist the Peace Commission in negotiating the great treaty with the late hostile Sioux in 1868, and their names are appended to the document. He died at St Louis in May, 1872, as the result of an accident while in Europe.

Smith, John S. Cheyenne Vocabulary. Manuscript vocabulary of 323 words, recorded on one of the Schoolcraft blank schedules (signed at end, "Department of the Interior, Office of Indian Affairs, Washington — H. R. S."), and intended for incorporation in Schoolcraft's *Indian Tribes*. Original MS., of date 1852 or earlier, in the collection of the Bureau of American Ethnology.

The same vocabulary, with a corresponding Arapaho vocabulary by the same author, appears in Schoolcraft, III, 446–459, 1853. Domenech (*q. v.*) and Haines (*q. v.*) also copy portions without credit.

John S. Smith, known to the Cheyenne as *Poómŭts*, 'Gray Blanket' *i. e.*, 'Blackfoot Indian,' corrupted by the Kiowa to *Pohómè*, was born in December, 1810, in one of the eastern states, and went to Colorado in 1830, from which time until his death he was in intimate association with the Cheyenne and other tribes of the upper Arkansas. While serving in the employ of the trading firm of Bent & St Vrain, he acquired a fluent command of the Cheyenne language, which led to his employment as official United States interpreter for that tribe, in which connection his name appears affixed to the treaties of Fort Laramie, 1851; Fort Wise, 1861; Little Arkansas, 1865; and Medicine Lodge, 1867. His first wife was a Blackfoot woman, whence his Indian name. Having afterward married a Cheyenne wife, by whom he had children, he was recognized by the Indians as belonging to the latter tribe. In 1865 he gave testimony in Washington concerning the Chivington massacre, having been present in the Indian camp when the attack was made. His young half-breed son, who was also present, was shot by the militia after having surrendered. In 1868, according to Keim, he selected the site for Fort Supply. In 1870 Smith accompanied a Cheyenne and Arapaho delegation to Washington, and died a few days after his return, at the agency at Darlington, Okla. He is buried in the sand hills on the north bank of the Canadian, about two miles above the agency. A half-breed daughter still lives in the tribe.

Lieutenant Abert (*q. v.*), who employed Smith as an interpreter while stopping at Bent's Fort in 1846, says: "With the assistance of Mr. Smith, who trades for the fort, and who speaks the Cheynne [*sic*] language, better, perhaps, than any other white person in the country, I made notes of everything that my red friends communicated."

Smith, *Gen.* **Persifer F.,** *et al.* Reports on Cheyenne hostilities in 1856. In *Transactions of the Kansas State Historical Society*, IV, Topeka, 1890.

Reports from General Smith, department commander, Captain Stewart, and Captain Wharton.

Sumner, *Col.* **E. V.,** *et al.* Report of engagement with Cheyennes on Solomon fork, Kans., July 29, 1857, and destruction of the camp. In *Transactions of the Kansas State Historical Society*, V, pp. 299-301 (with supplementary notices by Gov. Walker, Major Armistead, and Lieutenant Merrill, pp. 370–373), Topeka, 1896.

Treaties. Indian Treaties, and Laws and Regulations relating to Indian Affairs [etc.]. Washington, 1826.

Contains first treaty with "Chayennes," 1825, with 13 Indian signatures, in Sioux language.

—— Treaties between the United States of America and the several Indian tribes, from 1778 to 1837 [etc.]. Washington, 1837.

Contains same treaty and signatures.

—— A Compilation of all the Treaties between the United States and the Indian tribes, now in force as Laws. Washington, 1873.

Contains treaties of Little Arkansas, 1865; Medicine Lodge, 1867; Fort Laramie, 1868 (Northern Cheyenne and Arapaho) — all concerning the Cheyenne, but without signatures.

—— Indian Affairs: Laws and Treaties. Compiled and edited by Charles J. Kappler, LL.M., clerk to the Senate Committee on Indian Affairs. 2 volumes. Volume I, Laws; Volume II, Treaties. Washington, 1904.

Volume I contains Allotment Agreement of 1890, with other Cheyenne legislation and statistics. Volume II contains Cheyenne, etc., treaties of 1825, 1851 (Fort Laramie), 1861 (Fort Wise), 1865, 1867, 1868.

Van der Velden, *Rev.* Aloysius. Jesuit priest of St Labre's mission, Northern Cheyenne, Ashland, Montana, 1885–97. In December, 1906, stationed at St Francis Regis mission, Ward, Washington.

"The only one who ever compiled anything in the Cheyenne language at this mission was the Rev. Father Van der Velden, who lived here from 1885 to 1897. None of his writings have ever been printed, so far as I know, and I have reason to believe they have become scattered or destroyed. I think most of his writings were confined to the translation of the Old and New Testaments, also the History of the Bible." — Letter of Rev. P. M. Gallagher, rector of the mission, Dec. 6, 1906. Concerning Father Van der Velden's work, Rev. C. A. Linscheid, Mennonite missionary to the Northern Cheyenne, writes, Sept. 10, 1906: "I learn from the Indians that he spoke Cheyenne; to what extent of course I cannot tell. They also tell me that he had written prayers, which he read to them."

Verendrye, Varennes de la, *et al.* Documents relating to explorations and Indian negotiations by the Verendryes, *circa* 1735–50, particularly the expedition of 1742–43, from Winnipeg and the Mandan southwest to the Rocky mountains. In Margry, *Découvertes*, VI, 598–611, passim, 1886.

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SKETCH OF THE CHEYENNE GRAMMAR

BY

RODOLPHE PETTER

CONTENTS

PAGE

Introduction 447

I — Etymologic Value of Cheyenne Sounds 449

II — Word Formation 449

III — The Noun 451

IV — Adjectives, Adverbs, Prepositions, Conjunctions, Interjections, and Articles 457

V — Pronouns 459

VI — Numerals 461

VII — The Verb 463

A — The Coördinate Verbal Form 464

B — The Subordinate Verbal Form 472

VIII — General Character of Cheyenne Speech 476

SKETCH OF THE CHEYENNE GRAMMAR

By RODOLPHE PETTER

Introduction

When we say that the Cheyenne language has been classified with the Algonquian linguistic family, an introduction to the *general* character of the language is not needed here.

Still it must be borne in mind that an exhaustive comparative study of the Cheyenne can be entered upon only when the grammatic structure has been thoroughly determined. By the courtesy of the Bureau of American Ethnology I have had access to grammars and dictionaries of the Ojibwa, Cree, Micmac, Blackfoot, and Natick. My time was too limited to make an extended comparative study, but so far as I could judge the Cheyenne bears closer affinity to the Natick than to any other of the above named languages. The grammatic structure of the Cheyenne appears to be very different from the Ojibwa and Cree as well as from the Micmac and Natick. A common alphabet or a key to the systems used by the various authors in recording these languages would have given me a sure basis for comparison, but I failed to find such a guide in the grammars and dictionaries to which I have had access.

In the narrow limits of this sketch a full insight into the grammatic structure of the Cheyenne cannot be given, but I shall be well rewarded if students of Indian languages, especially Algonquian philologists, can make some use of it for further comparative study.

In working out the Cheyenne grammar I was careful not to mold it after preconceived ideas, but to let it naturally evolve itself from the language. After twelve years of constant study the mutation of vowels and consonants impelled me to search for the actual value of these sounds. It was after three years of unabated research that I was rewarded by a definite result.

Strictly speaking, the Cheyenne has only three vowel sounds, *a*, *e*, and *o* (to which we give the continental pronunciation). The vowel *i* takes the place of *e* in rapid speech or when contempt is implied. When *i* is followed by *a* or *o* it then is pronounced like *y* in *year*, *yes*. Examples: *one-se-om-etto* 'truly,' becomes *oni-sy-om-etto* in rapid speech or in contempt; *e-pe-va* 'he is good,' *e-me-se* 'he eats,' become *i-pi-va* and *i-mi-si* in colloquial language. *E-ha-mox-ta-eo* 'they are sick', *vo-na-e-om* 'temple of cleansing,' become *e-ha-mox-ta-yo* and *vo-na-yom* in rapid speech. The same is the case with the vowel *u*, which is a colloquial *o*, as *iu*, *eu*, pronounced like *u* in careless speech or in expressions of contempt. In my observation of these sounds I have discovered that *e* and *o* are pronounced *i* and *u*: (1) in rapid speech and to express contempt by *all* Cheyenne; (2) by half-breeds and such Indians as have lived in closer contact with white men, especially Indian women having white husbands. I believe further that the tendency among the younger generation to speak more rapidly brings the sounds *i* and *u* more to the foreground. But this is corrupt Cheyenne, and this sketch endeavors to present the language in its correct form.

The long sound of a vowel is indicated by a dash over it, as *ā*, *ē*, and *ō*; the short, abrupt sound by an accent, as *á*, *é*, and *ó*. An aspirated sound we mark by an inverted comma, thus, *a'*, *e'*, and *o'*. Contraction of *a* and *o* we designate by *â*, while *o* + *e* contracts into *ô*, pronounced as *oi* in oil. The evanescent sound we represent by a breve, *ă*, *ĕ*, *ŏ*. The Cheyenne has no *d*, *f*, *j*, *l*, or *r*. It has different *s* sounds which we designate by: (1) *s* for the common *s* as in *so*, *such*; (2) *z* as German *z*, a very sharp hissing sound; (3) *ts*, a softer hissing sound, a little sharper than *z* in *azure*; (4) *t's* pronounced as though a very short *o* were between *t* and *s*; (5) *š* for an *s* sound which cannot be represented by *sh*, as it is much softer; its frequent use would also render the spelling cumbrous if rendered by *sh*. The sound of *ch* in *church* does not exist in Cheyenne, but with the letter *c* we express a sound very similar to *q* in the French word *inquiet*. Close attention will also show that the Cheyenne has

no *w* or *v* sounds; we use the letter *v* to express a sound similar to *hu* in the French *huit, huile.* As the letter *q* is used to render a peculiar *k* sound at the close of words, we designate the German guttural sound of *ch* by the letter *x*.

I. — Etymologic Value of Cheyenne Sounds

a denotes predicate, subjectivity, state, adjectivity.
á denotes above meaning, but abrupt, separate, or negative.
ā denotes above meaning, but extensive or intensive.

e denotes article, item, it, substance, take place, pass, occur.
é denotes above meaning, but abrupt, separate, or negative.
ē denotes above meaning, but intensive or extensive.

o denotes objectivity, actual, body, set, one, in, solid.
ó denotes above meaning, but abrupt, separate, or negative.
ō denotes above meaning, but extensive, liquid, out.

b and *p* are used interchangeably. This sound denotes close against, cleave, chip, chop, flake, scale, etc.

c (pronounced somewhat like *t* in *mature*) is really a *k* before vowel *e*. It implies small, diminutive, curl, crest, curb.

g is identical with *k*, used by some Indians as a softer *k* as in *go*.

h denotes heave, heap, tend, forth.

k expresses short, diminutive, not full extent.

m denotes mediate, within, before, fore, aspect, tangent.

n denotes immediate, next, close, by, along, origin, spring.

s denotes part, sever, draw, issue.

š denotes loose, off, free, radiate.

t expresses unto, into, to, up to, at.

v denotes con-, corner, angle, bend, turn, with.

x expresses pressure, cross, through.

z implies pointing at, thus, this, etc.

II. — Word Formation

The compounding of the above sounds forms distinct syllables which in their turn become constantly modified to express subjectivity, activity, and objectivity. Cheyenne children speak in syllables, not in words. I have also noticed that old Indians, especially women, do not separate their sentences into distinct words, but each syllable is articulated separately. In sacred

speech or in oration an old Cheyenne speaks in "sentences," not words, that is, his sentence forms one word, the different parts of the sentence not being so much separated as the syllables.

The language abounds in syllables which, while rarely used alone, are constantly used as prefixes, infixes, and suffixes; they lend themselves to endless combinations, can be inserted or reduplicated in the same word, and changed for others or compounded with others. Some of these particles are:

(1) *-ha-* tense, in a high degree; *-há-* drop from; *-he-* to be to, unto; *-hé-* to be from, unto; *-ho-* come in; *-hô-* not reach; *-hō-* to go out; *-ka-* to be short; *-ko-* to set short; *-ce-* to be yielding, concave, soft; *-ma-* the, all of; *-me-* to appear, aspect of; *-hesse-* issue from, cause, from; *-hestōe-* issue from out; *-hov-* to gather, fold, heap; *-hōve-* empty, in vain; *-ta-om-* of self; *-me-no-* by group; *-nithov-* together as one; *-só-* still, at it, during; *-me-to-* alternating; *-ēve-* engaged in; *-ox-c-* habitually; *-as-* start; *one-se* attempt; *-o-ne-se-om-* truly; *-nee-* pursue; *-shov-* lessening; *-ox-* otherwise.

(2) Comparative particles: *he'-pe* beyond, more; *oha* very much; *oham* more, rather; *hoss-o-ham* still more; *sē* alike; *ho-o-va* as much; *nanos* above all.

(3) Infixes expressing continuity: *nše* keeping on; *ame* on, forward; *ō-e'-nov* holding out; *ne-nov* awhile; *me-sē* always; *sónše* still at it.

(4) Infixes expressing mental or moral condition: *pe-va* good; *ha-vse-va* bad; *-he-to-ta* gladly; *vo-e-še* with joy, satisfaction; *to-taz* despising; *nox-tov* able.

(5) Infixes implying posture: *-ho-txa* crosswise; *no-vo* bent forward; *eneha* holding upward; *eama* on the side; *zeš-kse-on* akimbo; *ho-so* backward; *ho-ox-se* leaning against; *ne-o-ve* standing; *ko-no* 'packing' ('hockend'); *ma-c-se* stooped; *ta-xe* upon; and so on.

The suffix *-ac, -ace, -aco* refers to being headed.

"	" *-sta-ha*	"	" hearted.
"	" *-zes-ta*	"	" minded.
"	" *-o-an*	"	" utterance.
"	" *-o-nen*	"	" teeth.
"	" *-esz*	"	" lips (speak).
"	" *-ēs*	"	" nose.

The suffix	*-en*	refers to	face.
" "	*-ō, -nō*	" "	look, sight.
" "	*-e-xan*	" "	eyes.
" "	*-ēs-ta*	" "	ears.
" "	*-o-ves*	" "	hair (long hair).
" "	*-á*	" "	fur, haired.
" "	*-ev-a-e-na*	" "	arms.
" "	*-eo-na*	" "	hands.
" "	*-sta-eo-na*	" "	palms of hands.
" "	*-eos*	" "	fingers.
" "	*-ze-en*	" "	tips of fingers.
" "	*-ox-ta*	" "	legs.
" "	*-e-nom*	" "	thigh.
" "	*-as*	" "	abdowen.
" "	*-has*	" "	fire.
" "	*-nstan*	" "	knee.
" "	*-ax-ta*	" "	foot.
" "	*-tan*	" "	moral or mental.
" "	*-o-ma-ta*	" "	feeling.

III. — The Noun

The true understanding of the Cheyenne noun presupposes a full comprehension of the verb. Thus its real place belongs after the verb in the grammatic arrangement of the language. In this sketch we shall treat it first.

We divide the Cheyenne nouns into fourteen different noun forms. Each noun can adopt either one or several of these forms.

(1) Nouns ending with suffix *-a*. Examples:

ho-to-a, cattle, buffalo. *ma-ta*, timber, wood.
o-ho-na, stone, rock, mountain. *ho-e-ma*, law, decrees.
ho-to-a-na-vo-o-ma, hardship, 'das Schwere.'

Such nouns always, if not *pluralia tantum*, denote a class of, category.

(2) Nouns ending with *o* or *ō*. Examples:

o-xo-vo, bridge, 'Crosser' from *na-o-xo-ve'n*, I cross.
ox-to-vō, merchandize; from *na-ox-to-va*, I trade.
hos-to, news; from *na-ho-es-ta*, I tell it abroad.

mxis-to, paper, book; from *na-mxes-ton*, I write.
mans·to, handiwork; from *na-ma-ne-sz*, I make it.

Such nouns imply objectivity.

(3) Nouns ending with *e*. Examples:

ho-e, earth; *vo-e*, sky; *o-he*, river.

Such nouns denote substance, being, article.

(4) Nouns with suffix *-van* or *-vhan*. Examples:

nāe-van, death, personified; from *na-nāe*, I die.
hā-mox-tae-vhan, sickness; from *na-ha-mox-toe*, I am sick.
nha-ene-vhan, catcher; from *na-nha-en-en*, I catch.

This suffix *-van* implies a personal agent. To this class of nouns belongs also such a suffix as *-an*. Examples:

ma-tše-tan, das Denken; *maz-ta-han*, that which is heart.
maz-hesta, the heart; *vos-tan*, person, which has being.
zes-tạn, that which is Cheyenne, Cheyenne tribe, person.

(5) Nouns ending in *-oxz* and *-oxzz*. Examples:

ae-no-vox-zz, property, subject to; from *na-ae-no*, I own him.
hoe-ma-ox-zz, law, which one has; from *na-hoe-man*, I make a law.

Such nouns have a subjective-objective nature.

(6) Nouns ending in *-estoz -stoz*. Examples:

o-xo-vo-hes-toz, the bridging; from *na-o-xo-ve'n*, I cross.
vos-tan-ehe-ves-toz, the living; from *vos-tan*, person.
a-me-tan-en-es-toz, the living; from *na-a-me*, *ta-nen*, I live.
nā-es-toz, the dying; from *na-nāe*, I die.

Such nouns are verbal substantives and are extensively used.

(7) Nouns with suffix *-xe* or *-stxe*. Examples:

o-ho-na-stxe, place of stones, region of stones.
ma-ta-stxe, place of woods.
hav-sev-stxe, place of evil.
nā-stxe, place of the dead.

Such nouns imply a place, region, collection, all of.

(8) Nouns ending in *-eše*. Examples:

šis-ta-to-e-še, growth of cedar; from *šis-ta-to*, cedar or pine.
maxe-me-no-e-še, orchard of apple trees.
ha-oe-tam-oxz-e-še, the depths.

Such nouns indicate growth, radiation, spread, issuance.

(9) Diminutive noun form. This takes place by adding the suffix *-es*, *-s*, or *-son* to express 'young,' and the suffix *-k* or *-c* to express 'small.' Examples:

e-ma-o, it is red;	*e-ma-ko*, it is 'little' red.
ma-e-ma-ka-et, red metal;	*ma-ce-ma-ka-et*, little red metal.
ma-ha-et, iron in bulk;	*ma-ka-et*, small piece of iron.
mo-ox-ta, black (in bulk);	*mo-k-ta*, small black.
ve-ho, chief;	*ve-ho-c*, little chief.
ve'-ho, white man;	*ve'-ho-ces*, young white man.
he-tan-evō, cloud-man (Arapaho);	*he-tan-evo-eson*, young Arapaho.
o-he, river;	*o-hec*, little river.
o-ho-na, stone;	*o-ho-nac*, small stone; *o-ho-na-es*, young stone.

A few nouns have different words for the diminutive:

ho-ne, wolf;	*mo'-na-ze-zes*, wolf pup.
xa-ma-hox-zz, cottonwood;	*mes-ze*, young cottonwood.
ve-ces, bird;	*mo-ne-vat*, young bird.

Sometimes the noun is prefixed by *-ka*, 'short,' to express the diminutive. Example:

ka-osz, short grass; *ha-osz*, long grass.

(10) Ablative noun form. This occurs when the noun is suffixed by *-evă*. Nouns ending in *-toz* make *-ovă*. Examples:

o-ho-na-evă, by, with the stone;	from *o-ho-na*, stone.
hoxze-zevă, on, in, by the tree;	from *hoxzz*, tree.
me-ses-tovă, by, with, through food;	from *me-ses-toz*, food.
ma'-pe-vă, by, in the water;	from *ma'p*, water.

Common names of persons form their ablative by the suffix *-o*:

he-tan, man; *he-tan-o*, by man.

(11) Proper names. These for the greater part are taken from sun, moon, stars, clouds, birds, animals, rocks, trees, with varied qualifications of size, strength, color, position, condition, etc. Examples:

E-še-ox-ma-hāsz, Red-sun or moon.
E-še-ox-me-e'nsz, Sun-coming-up.
E-še-ox-mox-ta-vasz, Black-sun or moon.
Vo-eva-ox-taxe-osz, On-cloud-a-sitting-one (Man-on-the-cloud).

Vo-e-ve-ho, Cloud-chief.
Niz-vo-ko-masz, White-Eagle.
E-o-ve-ā-no, Yellow-Hawk.
Na'k-ox-hāsz, Brave-Bear.
Ho-to-a-xō-sz, Bull-Sitting.

It will be seen that particle *ox* is much used as an infix, sometimes as a prefix; it indicates a verbal proper noun.

(12) Names of plants and shrubs. These are for the greater part suffixed by *-óe*, *-nóe*, *ósz*, *-nósz*, the vowel *ó* indicating 'plant' or 'grass.' Examples:

maxemenósz, plum shrubs.
vanósz, sagebrush.
mae-no-a-ne-o-nósz, sumac.
mae-me-nósz, cherry shrub.
vi-ta-nósz, cat-tail brush.
zes-tósz, prairie grass (in spring).
he-kósz, buffalo grass.
pavoó, good pasture.
oxo-ó, green grass.
ohaó, rank grass.
mhā-ósz, red-grass (rough prairie grass).

(13) Nouns in the plural form. The Cheyenne have a plural form for animate nouns, made by suffix *-eo*, except for words ending in *m* or *v*, which simply take *-o*. Thus:

he-tan, man; *hee*, woman; *kaš-gon*, child;
he-tan-eo, men. *hee-o*, women. *kaš-gon-eo*, children.

The plural form for inanimate nouns is rendered by suffix *-oz*. Nouns ending in *-toz* become *-totoz* in the plural; thus:

men, berry; *men-oz*, berries.
ēs-zis-toz, word; *ēs-zis-to-toz*, words.

Inanimate nouns ending with *a* in the singular take the suffix *-nsz* to form the plural; thus:

ma-ka-eta, money; *ma-ka etansz*, moneys.

As animate nouns the Cheyenne consider also the names of certain inanimate objects; thus, *o-ho-na* stone, *he-ne-no* tomato, *a-mo-ene-o* wagon, *aes-to-ma-me-ses-to-to* potato, are animate. Drygoods are also considered as animate.

(14) Possessive form of the noun. There are two sets of possessive pronominal prefixes:

na, my;	*ni*, of mine.
ni, thy;	*e*, of thine.
he, one's;	*heve*, of one's.
na, our (excl.);	*ni*, of ours (excl.).
ni, our (incl.);	*e*, of ours (incl.).
ni, your;	*e*, of yours.
he, their;	*heve*, of their.

Examples:

na-mha-yo, my house;	*ni-nov*, my home.
ni-mha-yo, thy house;	*e-nov*, thy home.
he-mha-yo, one's house;	*he-ve-nov*, one's home.
na-mha-yo-nan, our (excl.) house;	*ni-no-van*, our home.
ni-mha-yo-nan, our (incl.) house;	*e-no-van*, our home.
ni-mha-yo-nevo, your house;	*e-no-vevo*, your home.
he-mha-yo-nevo, their house;	*he-ve-no-vevo*, their home.

Acquired possession is usually distinguished by suffix *-am* or *-em*; thus:

men = berry

na-me-nam, my berry;	*na-me-na-moz*, my berries.
ni-me-nam, thy berry;	*ni-me-na-moz*, thy berries.
he-me-nam, one's berry;	*he-me-na-moz*, one's berries.
na-me-na-man, our (excl.) berry;	*na-me-na-ma-noz*, our berries.
ni-me-na-man, our (incl.) berry;	*ni-me-na-ma-noz*, our berries.
ni-me-na-mevo, your berry;	*ni-me-na-mevoz*, your berries.
he-me-na-me-vo, their berry;	*he-me-na-me-voz*, their berries.

kaš-gon = child (not own)

na-kaš-go-nam, my child;	*na-kaš-go-na-mo*, my children.
ni-kaš-go-nam, thy child;	*ni-kaš-go-na-mo*, thy children.
he-kaš-go-nam, one's child;	*he-kaš-go-namo*, one's children.
na-kaš-go-na-man, our (excl.) child;	*na-kaš-go-na-ma-neo*, our (excl.) children.
ni-kaš-go-na-man, our (incl.) child;	*ni-kaš-go-na-ma-neo*, our (incl.) children.
ni-kaš-go-na-mevo, your child;	*ni-kaš-go-na-me-vō*, your children.
he-kaš-go-na-mevo, their child;	*he-kaš-go-na-me-vō*, their children.

Forms denoting inherent possession drop the suffix *-am*, but take *-an*, *-evo* in the 1st, 2d, and 3d person plural.

There are other possessive forms on which this sketch cannot dwell.

The Cheyenne makes no definite distinction between genders. Some nouns suffix *-a*, which denotes the feminine, also subjectivity. Examples:

na'-ko, bear;	*na'-ka*, she bear.
ve'-ho, white man;	*ve'-ho-a*, white woman.

This formation is no doubt very old; its use seems to be restricted to a few nouns and proper names. To distinguish between male and female the Cheyenne use the prefix *he-tane*, male, and *hee*, female. In some proper names the suffix *ō* (opened, out, distant, etc.) is used to express the feminine. Following is a short list of proper names, masculine and feminine:

Na'-ko-e-vo-ē-ta, Bear-doing (acting)-well (male).
Na'-ka, Bear-woman.
Veox-ce-na'-ka, Bitter-Bear-woman.
Na'-k-no-ka, Bear-Alone-woman.
Na'-ko-eme-ona, Bear-Road-woman.
Na'-ko-eno-nē, Bear-Singing-woman.
Mae-ves, Red-Bird.
Mae-ve-kse-a, Red-Bird-woman.
Taxem, Buffalo-Wallow.
Taxe-me-ō, Buffalo-Wallow-woman.
Hotoa, Buffalo-Bull.
Hot-ox-ka, Buffalo-Bull-woman.
Es-se-vo-na, Buffalo-woman.
Ox-me-e'nsz, Coming-up.
Me-eō, Coming-up-woman.

Following are examples of different noun-forms:

hoe-mane, law-maker, really 'Gesetzer.'
ze-hoe-mansz, he-who-makes-law.
hoe-ma-osane, judge, law-issuer.
Hoe-ma-evan, the law (personified).
hoe-ma, that which is law.
hoe-man-es-toz, the passing of a law.
Ox-hoe-man-sz, law (proper name).

hoe-mans-txe, realm of laws.
hoe-ma-ova-zes-toz, the making of a law for one.
hoe-ma-oxz, law which one has.
hoe-ma-o-ta-zes-toz, the passing of law upon one.
hoe-mane-tan-ox-toz, the desire of making a law.
hoe-mane-vo-mo-tsa-nis-toz, a law in behalf of one.
hoe-mane-me-a-he, law-giver.
tā-eva-vho-e-ma-nis-toz, regulation.
hoe-mane-mha-yo, court-house.
hoe-mane-ve'-ho, lawyer.
hoe-mane-ma-ha-kse-o, old council men (applied also to Senators at Washington).
hoe-mane-mxis-to, law book.
ono-hoe-ma-nis-toz, just law.
pav-hoe-ma-nis-toz, good law.

IV. — Adjectives, Adverbs, Prepositions, Conjunctions, Interjections, and Articles

(1) Adjectives are incorporated usually in the noun as infixes; as predicates in the verb they are rendered by suffix *-a*, thus:

ha-vse-va-vos-tan-ehe-ves-toz, bad life, or a life which is bad.
e-pe-va, it is good.
e-he-ne-eno-vae, he is learned.
e-hes-ze-he-na, he is coated (from *eszehen*, coat, shirt).

But as in Cheyenne many nouns are verbal in form, the infixes have more the character of adverbs than of adjectives; thus *ha-vse-ve-vos-tan-ehe-ves-toz*, 'badly living,' is more nearly correct for the Indian than *hav-se-va-vos-tan-ehe-ves-toz*, 'bad life.'

The characteristic sign of the pure adjective form in an infix or a suffix is the vowel *a*, while the vowel *e* indicates an adverb. Examples:

e-hā-mox-tae, one is sick.
e-ha-ô-na, one is praying.
e-si-tc-vōs-ena, it is mid-day.
e-mae-ox-tae, he is red-legged.
a-me-ta-ne-ne-ma'p, living water, or water with life.
na-ni-vse-vō-me-ma'p, clear water, or 'through-seen water.'

(2) ADVERBS are used always as infixes, usually ending with *e*. Examples:

na-pe-ve-ēsz, I well speak; from *na* I, *peve* well, *ēsz* speak, utter, 'lip out.'

na-hav-se-ve-ma-nesz, I make it badly; from *na* I, *havseve* badly, *manesz* make it.

na-no-no-tove-neoxz, I go hurriedly; from *na* I, *nonotove* hurriedly, *neoxz* go.

(3) PREPOSITIONS are used in divers ways, either incorporated in the verb or detached. When infixed they are used like adverbs; when detached they suffix *-to*; for instance: *-ēs-*, into, as infix; *na-ēs-ē-na-na* I into put it; or, I can say *ēs-eto na-ē-nana*, into I put it. The detached preposition emphasizes its importance. Oftentimes the preposition requires the ablative form of the noun. Example: *e-ta-xe-hoe ma'-pe-va*, he stands upon (*taxe*) the water: *e-ta-xe-hoe ma'p* would be incorrect; *ta-xe-to ma'-pe-va e-hoe*, upon water he stands (or sits). When the preposition relates the verb with a pronoun, it is usually expressed by *t* in the suffix; for instance, *na-ha-ô-na* I am praying, *na-ha-ô-na-tovo* I am praying to him; *na-ka-ne-oz* I am tired, *na-ka-ne-oz-etovo* I am tired of him, etc.

(4) CONJUNCTIONS are found detached and infixed. *nā*, and; *oha*, but; *ma-to*, too; *a-has*, also; *nitho-ve-to*, together with, are always used separately. *ox*, though, otherwise; *va'-tom*, nevertheless; *só*, still; *hesse*, because; *ve*, with, are usually infixed.

(5) INTERJECTIONS are always detached particles.

yā! denoting surprise (used by males only).
na'-ko-ē! denoting surprise (used by females only).
no-ō! no-ō! ah! (used by women).
hax-c! denotes impatience, annoyance.
hes-c! denotes astonishment, "du liebe Zeit!"
aho-yā! or *aha-hē* denotes woe.
go! expresses poor; pauvre diable!
ahā, denotes 'wohl auf.'
ne-hē! implies disgust.
nohetto! go ahead! now then!
neš! quit!
hoxtao, 'absolut nicht.'

Exclamations in plays and when making herald announcements are expressed by suffix *-ēē* to the words, as *mo-hē-oxze-ēē! he-tan-esz-ēē! ni-o-nō-man-emē-ē!* 'gather ye men, you are called.' In former times these forms were always used by Cheyenne at their different out-of-door plays, but the younger generation have dropped the ending *-ēē* and it seems to have destroyed the charm of such plays.

(6) Strictly speaking there is no article in Cheyenne, but there are two prefixes that come near to it, viz, *ma-* prefixed to nouns, and *o-* prefixed to verbs:

ma-ex, the eye, 'alles vas Auge ist.'
ma-vō-sa-nes-toz, the seeing, that which is sight.
ma-he-o, das was Father is, All-father. This word is used exclusively to mean Creator, Erzeuger, God; from *nihoe*, my father.
ma-axe, that which is mother, 'was Mutter heisst'; from *na'-ko-e*, my mother.
o-me-se-nov, the eating, when there is eating.
o-ne-oxze-nov, the going there, when there is a going.
o-vōs-ane-nov, the seeing, when there is a seeing.

V. — Pronouns

(1) Personal Pronouns are: *na*, I; *ni*, thou, and *e*, one, which are prefixed to the stem of the verb. The plural personal pronouns are: *na-*, we (excl.); *ni*, we (incl.); *ni*, you; *e*, they. But these plural persons require a special suffix to the verbal stem, thus:

na — *heme*, we (one and I). *ni* — *hemă*, we (you and I).
ni — *heme*, you. *e* — (*e*)*o*, they.

Examples:

na-vō-san, I-sight-issue, I see. *ni-vō-san*, thou seest.
e-vō-san, one sees. *na-vō-san-heme*, one and I see.
ni-vō-san-he-mă, you and I see. *ni-vō-san-he-me*, you see.
e-vō-san-eo, they see.

na-nē-hov, I, myself, my being.
ni-nē-hov, thou, thyself.
e-nē-hov, one, itself.
na-nē-hov-heme, one and I, ourselves.

ni-nē-hov-hema, you and I, ourselves.
ni-nēhov-heme, you, yourselves.
e-nēhov-eo, they, themselves.
ni-tov, by me, with me (ablative form).
e-tov, by thee, etc.
he-ve-tov, by one, etc.
nitovan, by one and me, by us, etc.
etov-an, by you and me, by us, etc.
eto-ve-vo, by you, etc.
he-ve-to-ve-vo, by them, etc.

(2) DEMONSTRATIVE PRONOUNS:

ze-to, this one (animate); *tato*, that one (anim.).
he-to, this one (inanimate); *hato*, that one (inan.).

These are always detached particles. The Cheyenne makes extensive use of participial forms in dependent clauses, and in such cases the pronoun is incorporated as prefix and suffix. (See "Subordinate verbal form.")

(3) RELATIVE PRONOUNS:

nha, the one who (subjective).
nhė, the one (mentioned before).
ne-a-hāne, he is the one who (anim.).
ne-a-hā-ne-vo, they are the ones who (inan.)
e-na-hā-ne, it is the one which.
e-na-hā-ne-vosz, those are the ones which.
hene, that which (mentioned before).
hane, that which (subjective).

(4) INTERROGATIVE PRONOUNS:

ne-vā? Who? (sing. anim.); *ne-vā-seo?* Who? (pl. inan.).
henova? What is it? *he-no-va-e-oxz?* What are they? (inan.).
henā? Why? What is it for? *he-na-e-oxz?* What are they for? (inan.).
tā-se-vo? Which one is it? *ne-va ze-to?* Who is this? (anim.).
ne-va ta-to? Who is that? (anim.).

There are three pronominal particles that play an important rôle in the verbs as infixes: *-ze-*, *-he-*, and *-ne-*. *-ze-* denotes 'it forth, ahead,' and has a demonstrative "pointing" force.

-he- denotes 'it to one' and has a possessive meaning; thus, *na-he-ve-hes-tov*, I-it is to-name, *ὄνομά μοί ἐστι* (*mihi nomen est*); *na-he-ve-hō-mŏ*, I-have-to-see-one; *na-he-vēs-to-me-vo*, I-it is unto-ask-of-him, or, it is that which I ask of him, from *na-vēs-to-me-vo*, I ask of him. *-ne-* denotes relation, the "it mentioned" "it, there," etc. Example: *na-nē-hov*, it is I, I am the one who, I myself.

VI. — Numerals

(1) Cardinal Numbers:

no-kă, 1
ni-xă, 2
nāă, 3
ne-vă, 4
nohon, 5
nā-sox-toă, 6 (one added)
ni-sox-toă, 7 (two added)
nā-nox-toă, 8 (three added)
só-ox-toă, 9 (still added)
ma-tox-toa, 10 (all of it)
ma-toxt-oxt-no-kă, 11
ma-toxt-oxt-ni-xă, 12.

Oftentimes the prefix *ma-toxt* is omitted:

no-kóe, 10 (une dizaine)
ni-sóe, 20 (une vingtaine)
na-nóe, 30
nivóe, 40
nohonóe, 50
nā-soxt-nóe, 60
ni-soxt-nóe, 70
na-noxt-nóe, 80
só-oxt-nóe, 90 (une noinantaine)
ma-toxt-nóe, 100 (une centaine)
nokă-ma-toxt-nóe, one hundred
ni-xă-ma-toxt-noe, 200
no-kă-ma-toxt-nóe oxt-no-kóe, 110
no-ka-ma-toxt-nóe oxt-ni-xa, 112
nohona-ma-toxt-noe oxt-no-ho-nóe oxt-nohon, 555
ma-tox-toă-ma-toxt-noe, 10 times 100
maxe-ma-toxt-noe, 1,000 or 10,000
vo-no-es-tons-tov, lost in number, myriads, millions.

The above numerals when infixed in the verb take the following forms:

na-noce-mese, I-one-eat;
ni-niše-mes-hema, we-2-eat;
ni-nāhe-mes-heme, you-3-eat;
e-nive-meseo, they-4-eat;
ni-nā-sox-txe-mes-hemă, we-6-eat;
ni-oxt-no-ce-mes-hemă, we-11-eat;
ni-nisóe-mes-heme, you-20-eat.

(2) Ordinal Numbers:

ze-vo-vo-asz, the first (anim.);
{*ze-ho-na-o-vasz*, the 2d (anim.);
{*ze-ni-xa-o·vasz*, the 2d (anim.);
ze-vo-vo-o-netto (inan.).
{*ze-ho-na-o-netto* (inan.).
{*ze-nixa-o-netto* (inan.).

ze-na-ha-o-vasz, the 3rd (anim.); *ze-na-ha-o-netto* (inan.).
ze-no-ho-na-o-vasz, the 5th (anim.); *ze-no-ho-na-o-netto* (inan.).
ze-na-soxt-ta-o-vasz, the 6th (anim.); *ze-na-sox-ta-o-netto* (inan.).
ze-oxt-no-ka-o-vasz, the 11th (anim.); *ze-oxt-no-ka-o-netto* (inan.).
ze-ni-só-o-vasz, the 20th (anim.); *ze-ni-só-o-netto* (inan.).

ze-vo-vo-á-etto, I, the first one. *ze-vo-vo-a-étto*, thou, the first one.
ze-vo-vo-asz, one, the first one. *ze-vo-vo-a-ez*, we, the first ones.
ze-vo-vo-a-ess, you, the first ones. *ze-vo-vo-a-evoz*, they, the first ones.
ze-vo-vo-a-ets, they, the first ones (excl.).

(3) MULTIPLICATIVE NUMBERS:

noká, once. *na-sox-tá*, six times.
nixá, twice. *ma-tox-tá*, ten times.
nāhá, thrice. *oxt-no-ká*, eleven times.
nivá, four times. *ni-só*, twenty times.

Example:

ni-xá	*e-šē-va*	*na-me-se*
twice	in a day	I eat

nixá tó-evha-vetto ni-xă, two times over again two
no-ho-na tó-evha-vetto ne-vă, five times over again four.

(4) NUMBERS EXPRESSING RAMIFICATION, DIVISION:

e-ni-so-o-nae, it (anim.) is branched into 2.
e-na-no-o-nae, it (anim.) is branched into 3.
e-ne-vo-o-nae, it (anim.) is branched into 4.
e-no-ho-no-o-nae, it (anim.) is branched into 5.
e-na-soxt-o-o-nae, it (anim.) is branched into 6.
e-oxt-no-ko-o-nae, it (anim.) is branched into 11.
e-ni-só-o-nae, it (anim.) is branched into 20.

e-ni-so-o-nattŏ, it (inan.) branches into 2.
e-na-no-o-nattŏ, it (inan.) branches into 3.

e-ni-so-ne-o, it (clothing, drygoods), fringes into 2.
e-na-no-ne-o, it (clothing, drygoods), fringes into 3.
e-ne-vo-ne-o, it (clothing, drygoods), fringes into 4.
e-na-soxt-o-ne-o, it (clothing, drygoods), fringes into 5.
e-ni-só-o-ne-o, it (clothing, drygoods), fringes into 20.

(5) Numbers Expressing "Folded Together":

e-no-ká-ma-eă, it is folded once together.
e-ni-xá-ma-ea, it is folded twice together.
e-na-sox-tá-ma-ea, it is folded six times together.

(6) Numbers Expressing Fold, Infolded:

nok-hŏv, one-fold; *nok-hov ma-ta-o-ce-me-noz*, one-fold (package) of coffee.
nis-hov, two-fold.
na-nhŏv, three-fold, triple.
ni-vhŏv, quadruple.
no-hon-hŏv, quintuple.
só-oxt-hŏv, nonuple.
ni-só-hŏv, twenty-fold.

(7) Distributive Numerals:

no-no-nasz, one to each.
no-no-niš, two to each.
no-no-no-hó, five to each.
no-no-ni-só, twenty to each.
no-niš, two at a time to one.
no-nive, four at a time to one.
no-nahe, three at a time to one.
no-ma-toxte-mo-me-no-ea, by groups of 10.
no-nisoe-mo-me-no-ea, by groups of 20.

(8) Partitive Numerals:

na-sz, one of.
niš, two of.
na-he, three of.
ne-ve, four of.
no-hó, five of.
nā-sox-te, six of.
oxt-nasz, eleven of.
nisó, twenty of.

All the different forms of the numerals can be conjugated as verbs and form verbal substantives.

VII. — The Verb

Every student of Indian languages knows that their grammar is in the verb. In such a brief sketch as this we may only touch, in passing, the main structure of the verb without going into its infinite modifications and ramifications.

The embryos of the Cheyenne verb are the three vowels *a*, *e*, and *o*. The *e* changes into *i* only in rapid speech and when a syllable becomes very short. *a* denotes subjectivity, state; *e* implies issuance, being, existence, while *o* expresses object,

inherence, actuality. From these embryos are developed verbal stems, forms, persons, states, and modes.

The verb is naturally divided into two main forms — the *coordinate*, used for independent clauses, and the *subordinate*, used in expressing dependent clauses.

A. — THE COORDINATE VERBAL FORM

I. ITS PERSONS. — The coordinate verbal form has seven persons expressed by pronominal prefixes, as exemplified under "Personal Pronouns." The characteristic of the coordinate form are these pronominal prefixes.

II. ITS TENSES. — Tense or temporal form of the verb in Cheyenne is expressed by infixes inserted immediately after the pronominal prefix. The present tense has no special infix of time. Examples:

1. PRESENT: *na-me-se*, I eat (*me-se*, eat).
   ni-me-se, thou eatest.
   e-me-se, one eats.
   na-mes-he-mĕ, we (he and I) eat.
   ni-mes-he-mă, we (you and I) eat.
   ni-mes-he-mĕ, you eat.
   e-me-seŏ, they eat.
2. PAST: *na'-me-se*, I ate.

   (The aspirated sound is a sign of the past.)
3. PRETERIT: *na-eše-me-se*, I have eaten.
4. FUTURE: *na-ze-me-se*, I shall eat.

Thus in Cheyenne there is no special tense form modifying the stem of the verb; temporal infixes are used without causing any change in the flection of the verb. These infixes are numerous and lend a great possibility of temporal forms, several of which indicate minute degrees of time.

Following are some of the temporal infixes:

ta, at;	*tó*, at the very point;
tose, to be going to;	*ta-tose*, at the point of issuance;
meha, was;	*tše*, now, just now;
mone, recently;	*eš-ta*, reached;
eš-to-se, almost reached;	*vâs*, finished, complete.

III. Its States. — By verbal states we mean the peculiar condition of the verbal form. We find the following states:

1. Intransitive State, denoting the verbal form in its generic condition, having no specified object.

(a) With causative suffixes **-san** and **-sen**.

na-vō-san, I-sight-am with; I see.
na-vō-sen, I-sight-take place; I do see.

(b) With mental suffix **-tan**:

na-me-se-tan, I-eat-desire. *na-eše-tan*, I-do-in mind; I think.

(c) With progressive suffixes **-oxz, ax, e'n**:

ma-ha, large; *e-m-a-hae-oxz*, he-large becomes;
na-am-e'n, I-on-walk.

(d) With suffix **-eve**, 'to exist as':

he-tan, man, male; *na-he-tan-eve*, I-man-am-it; I am a man.
ve-ho, chief; *e-ve-ho-ne-ve*, he-chief-is-it.
(*v* denotes curve, bend, arch; *ve-ho*, the archer.)

(e) With suffix **-hess** or **-zhess**, like, similar:

e-he-tan-eve-zhess, it-man-is-like; it is manlike.

(f) With suffixes **-an, -en, -on**, implying relation.

-an, subjective relation:

na-me-tan, I-given-to-am; I am given to.

-en, performing, doing:

na-hes-tan-en, I-take, or I am taking.

-on, objective relation:

na-mea-ton, I-a gift-for one; I am given away.

(g) With suffixes —

-ová, haired, furred.
-ōva, referring to water: *na-nha-ōva*, I-caught-by water.
-tovā, referring to 'issuing smoke.'
-ō, referring to sight: *na-pev-ō*, I have good sight; *e-ho-xe-nō*, he looks clean.
-ó, referring to grass or plant: *e-o-haó*, it is very grassy.
-tamano, referring to a general aspect, condition, atmosphere: *e-pev-a-ta-ma-no*, it is good weather; *e-o-ha-ta-ma-no*, it is very risky, dangerous.

-eš, to be spread, lying, radiating: *na-o-veš,* I lie down; *na-ta-xe-o-eš,* I am cut.

-aha, referring to wind ('the thrower'): *na-ase-to-eōs-taha,* I-carried-out- (by) wind.

-vaen, referring to ablative or instrumental meaning: *na-me-ze-va-eno,* I let him have it, I pass it to him, hand it over to him; *na-hōe-ne-va-eno,* I let him go out = by me he goes out.

-éa, to be in a state: *en-so-om-ea,* it is boiling; *e-ma-tan-ea,* it is wasting away.

-os, referring to cold: *na-na-toss,* I am getting cold; *na-aha-nos,* I- (die) of cold; Je meurs de froid.

-evs-ton, made of: *ma-kae-ta,* iron, metal; *e-ma-kae-ta-eve,* it is iron; *e-ma-kae-ta-evs-ton,* it is made of iron.

-ohas, burning, flaming: *e-ma-xe-o-has,* it-great-flaming = burns with great flames.

2. IMPERSONAL STATE. — This is the impersonal verbal form prefixed by **e-** and suffixed by **-etto:**

e-mxes-ton, he writes; *e-mxes-ton-etto,* it writes.

me-ses-toz, food; *e-mses-tov,* it is a food; *e-mses-tov-etto,* it acts as a food.

e-me-se, he eats; *e-mse-nov,* there is an eating.

3. TRANSITIVE STATE. — This is the verb with a direct or indirect object, animate or inanimate. The characteristic suffixes of this state are **o** to indicate the animate, and **a** with **-esz** to express the inanimate. Examples:

na-vō-san, I am with sight; I see. *na-vō-mo,* I see one (anim.). *na-vōx-ta,* I see it.

The Transitive State has three voices:

Active voice: *na-vō-mo,* I see one.

Passive voice: *na-vō-man,* I am seen.

Reflective voice: *na-vō-maz,* I see myself (Je me vois).

The Active Voice takes —

(*a*) PERSONAL SUFFIXES. Examples:

na-vō-mo, I see one;
ni-vō-maz, I see three;
na-vō-mō, I see them;
ni-vō-maz-emĕ, I see you.

*ni-vŏ-m***o**, thou seest one;
ni-vō-mō, thou seest them;
*ni-vō-m***e**, thou seest me;
ni-vō-me-menŏ, thou seest us.

e-vō-mo, one sees one;
e-vō-māe, one is seen by one;
na-vō-ma, one sees me;
ni-vō-ma, one sees thee;
na-vō-maen, one sees us (he and I);
ni-vō-ma-en, one sees us (you and I);
ni-vō-ma-evŏ, one sees you;
e-vō-mō, one sees them;
e-vō-māĕ, one is seen by them.

na-vō-mon, we see one;
na-vō-mon-eo, we see them;
ni-vō-maz-eme-nŏ, we see thee or you.

ni-vō-mo-vŏ, you see one;
ni-vō-movō, you see them;
ni-vō-me-me, you see me;
ni-vō-me-me-nŏ, you see us.

e-vō-mo-vŏ, they see one;
e-vō-mo-vō, they see them;
na-vō-māe, they see me;
ni-vō-māe, they see thee;
na-vō-ma-en-eo, they see us;
ni-vō-ma-evō, they see you;
e-vō-ma-evō, they are seen by them.

(*b*) PERSONAL AND ACCUSATIVE ANIMATE SUFFIXES:

na-me-to, I-give-to one;
*ho-tam na-me-to-***notto**, dog, I give to one;
*ho-tam na-me-tae-***notto**, a dog one gives to me;
*ho-tam na-me-ton-***on**, a dog, we give to one;
*ho-tam na-me-ton-***ovŏ**, a dog, I give to them;
*ho-tam ni-me-taze-***notto**, a dog, I give to thee;
*ho-tam ni-me-ta-ze-***nov**, a dog, I give to you.

(*c*) PERSONAL AND ACCUSATIVE INANIMATE SUFFIXES:

na-me-to, I give it to one;
na-me-to-noz, I give those to one;

na-me-to-no-voz, I give those to them;
na-me-to-non, we give it to one;
na-me-to-non-sz, we give those to one;
na-me-to-ne-on-sz, we give those to them;
na-me-to-ne-on, we give it to them.

(*d*) INANIMATE ACCUSATIVE SUFFIXES:

na-vōx-ta, I see it;
ni-vōx-ta, thou seest it;
e-vōx-to, one sees it;
na-vōx-ta-non, we see it;
ni-vōx-ta-nov, you see it;
e-vōx-ta-nov, they see it;
na-vōx-ta-noz, I see those.
ni-vōx-ta-noz, thou seest those.
e-vōx-ta-noz, one sees those.
na-vōx-ta-non-sz, we see those.
ni-vōx-ta-no-voz, you see those.
e-vōx-ta-no-voz, they see those.

The Passive Voice takes the following personal suffixes:

*na-vōm-***an**, I am seen; I-seen-a-one.
*ni-vōm-***an**, thou art seen.
e-vōm-e, one is seen.
na-vōm-an-hemĕ, we (he and I) are seen.
ni-vōm-an-hemă, we (you and I) are seen.
ni-vōm-an-hemĕ, you are seen.
e-vōm-eo, they are seen.

This voice can also add animate and inanimate accusative suffixes, which are the same as for the active voice. Examples:

kaš-gon na-me-tan-e-notto, a child I am given to.
ma-kae-tan-sz ni-me-tan-e-no-voz, moneys you-given-are-to-those.

The Reflective Voice takes the following personal suffixes:

na-vōm-az, I see myself (Ich sehe mich);
ni-vōm-az, thou seest thyself;
e-vōm-az, one sees one's self;
na-vōm-az-hemĕ, we see ourselves (excl.);
ni-vōm-az-hemă, we see ourselves (incl.);
e-vōm-az-eo, they see themselves;
ni-vōm-az-hemŏ, you see yourselves.

The Transitive State has nine different objective suffixes, viz:

-mo (anim.), *-ōxta* (inan.) denotes correlative meaning;
-no (anim.), *-na* (inan.) denotes relative meaning;
-oto (anim.), *-oxta* (inan.) denotes dative meaning;
-eto (anim.), *-esta* (inan.) denotes prepositional clause;

-evo, ovo (anim.), *-a* (inan.) denotes ablative meaning;
-oho (anim.), *-oxz* (inan.) denotes accusative meaning.

(4) The Instrumental State of the verb is used whenever action is done by tool or instrument, something done "through, by means of," etc. The letters *s* and *x* are characteristic of this state. There are also three voices as in the transitive state. Examples:

Active Voice: *na-ta-xe-o-na-sŏ*, I cut his hand.
Passive Voice: *na-ta-xe-o-nae*, I have a hand cut.
Reflective Voice: *na-ta-xe-o-na-xĕsz*, I cut my hand.

na-ox-aso, I split one (anim.);
na-ox-a'-no, I split one (anim.), with strokes;
na-ox-o'-no, I split one (anim.), with one stroke;
na-von-âx-no, I-loose-by fire-one;
na-von-ōm-âx-no, I-loose-(by)liquid-hot-one: I scald him to death.

The flection of this Instrumental State is affected by the guttural sound, which forces the vowels to mutate in consequence. Examples:

na-ox-aso, I-in two-cut-one: I cut him in two;
na-ox-asō, I cut them in two;
ni-ox-axĕsz, I cut thee in two;
ni-ox-ax-e-zeme, I cut you in two;
ni-ox-axĕ, thou cuttest me in two;
ni-ox-axe-me-no, thou cuttest us in two;
na-ox-axē, they cut me in two;
na-ox-ax-ēn, he cut us in two.

Further exemplification of the Instrumental State, Animate and Inanimate:

na-é-so, I cut him off (considering the height or length);
na-éxă, I cut it off (considering the height or length);
na-onen-xâx-no, I-hurt-by fire-one (anim.);
na-onen-xâ-ha, I-hurt by fire-it;
na-hōe-nē-na'-no, I-out-send-one (as a messenger);
na-heš-kov-o'-no, I-thorn-prick-one;
na-heš-kov-o-ha, I prick it;
na-he-kō-mo, I peep at him;
na-he-kox-no, I peep at him (with eyeglass).

IV. ITS MODES. — By "modes" we understand special verbal suffixes attached to the stem to modify or characterize the action These modes are :

1. INDICATIVE —

na-vō-san, I see.

2. IMPERATIVE —

vō-san-sz, see thou !
vō-san-e, see you !
vō-sa-ne-o, then, there, see thou !
vō-sa-ne-hen, then, there, see you !
vōx-tŏz, see thou it !
vōx-tom, see you it !
vōx-to-meo, then, there, see thou it ;
vōx-to-ma-hen, see then, you it ;
vōm-sz, see thou me !
vōm-e, see you me !
vōm-ehă ! see thou him !
vom-a ! see you him !
vō-mō, then, there, see thou him !

3. HORTATIVE —

nše-vōme-ha, let him see him !
nše-vō-ma-es, let him see me !
ni-ta-vō-san-hema, let us see !

4. NEGATIVE —

na-saa-vō-mo-é, I do not see him ;
na-saa-vō-san-é, I do not see ;
na-saa-vōx-tô, I do not see it.

5. HYPOTHETIC —

mo-na-vō-sa-né, probably I see, no doubt I see ;
mo-vō-mo-evo, no doubt he sees him ;
mo-vōx-tô, he must see it.

6. INTERROGATIVE —

na-vō-sa-né, do I see ?
ni-vō-mo-hé, dost thou see him ?

7. ATTRIBUTIVE :

na-vō-san-e-măs, ich *soll* sehen ;
e-vō-san-ĕsz, er *soll* sehen ;

na-vō-mo-sz, ich *soll* ihn sehen ;
na-vōx-ta-nŏs, ich *soll* es sehen ;
ni-vō-maz-e-măs, ich *soll* dich sehen.

8. NARRATIVE —

e-vō-sane-hō, he saw (then);
e-vō-m-hōn, he saw him then ;
e-vō-mo-vo-hōn, they saw him then ;
e-vōx-tano, he saw it, then.

9. LOCATIVE —

na-ta-vō-san-emo, I shall be seeing there, then ;
na-ta-vō-mo-hō, I shall see him then or there ;
na-ta-vōx-ta-no, then, there, I shall be seeing it.

10. DESIDERATIVE —

na-vō-se-ne-tan, I want to see ;
na-vō-ma-ta-no-tov, I desire to see him ;
na-vōx-ta-ta-no-ta, I desire to see it.

11. DECLARATIVE —

na-pevo-osan, I-good declare ;
na-pevo-osemo, I-good-declare him ;
na-pevo-osesta, I-good-declare it.

12. GENITIVE-POSSESSIVE —

hes-to-ze-on na-vō-ma-mo.
his-servant I-see-his-him.

he-ma-a-ta-no na-vōx-to-mo-vo.
his-gun I-see-it-his.

he-vez na-ta-ne-oxz-evo.
his place I-going to it his.

13. SUBSTITUTIVE —

na-vō-sane-vō-mo-t'san.
I-see- for or in place.

na-vō-sane-vo-mo-ta-o, I see for him.

{ *na-me-a*, I give.
{ *na-mea-vo-mo-tao*, I give-for him, in his place.

There are a good many more modes, always characterized by the modal suffix. The verb is further modified by more than five hundred different modal particles, used as infixes, either alone or combined with each other. Examples :

na-veše-vōsan, I see with (instrument);
na-nehe-vō-san, I immediately see;
na-me-to-vō-san-heme, we-by turns-see;
na-me-vō-san, I may see;
na-ho-tse-vō-san, I endeavor to see;
na-nox-to-ve-vō-san, I am able to see;
na-emō-se-vō-san, I-secretly-see;
na-pe-ve-vō-san, I see well.
na-ve-se-vō-san, I see with (in fellowship with);
na-hoxe-e-vō-san, I see clearly;
na-he-vō-san, I have to see;
na-no-na-xe-vō-san, I-probably-see;
na-hó-ze-vō-san, I fail to see;
na-hot'se-vō-san, I repeatedly see;
na-ho-se-vō-san, I-again-see;
na-no-ze-vō-san, I am in need of seeing;
na-manoe-vō-san-hemĕ, we see together.

The Cheyenne reduplicate the first syllable of the verbal stem to express the iterative meaning of an action; thus:

na-pe-vo-ĕ-ta, I-well-act, becomes *na-po-pe-vo-ĕta*, I repeatedly, or many times, act well.
na-meto, I give to him; *na-mo-me-to-nov*, I give to each of them.
ešēva, daily; *o-ešē-va*, each day.
tā-eva, nightly; *tó-tā-eva*, each night.
na-oxo-ve'n, I cross; *na-ho-txo-ve'n*, I cross many times.
e-vox-ce-oz, it is crooked; *e-vo-vox-ce-oz*, it is crooked many times.
na-pe-ena, I grind it; *na-pe-pe-ena*, I grind it to many pieces, also I strew.
e-hav-se-va, it is bad; *eha-thav-se-va*, it is repeatedly bad.
e-pa-no-ta, it cleaves at the side; *e-pa-pa-no-ta*, it is spattered at the side.
na-mez-to-vo-éo, I torment him; *na-mo-mez-to-vo-éo*, I torment him many times.

B. — THE SUBORDINATE VERBAL FORM

This form of the verb is used mostly in dependent clauses and participial sentences. It is differentiated from the Coordinate Form by the absence of the pronominal prefixes and by a different set of suffixes. The Subordinate Verb has no Imperative, Hortative, Narrative, Hypothetic, or Interrogative mode, but it keeps all the tenses, states, and other modes of the Coordinate Verbal Form.

The persons are expressed by suffixes attached to the verb, which may or may not need any prefixes. Such prefixes have a demonstrative, conditional, conjunctive, and prepositional meaning. Examples:

ze-demonstrative, the one who; *ma*, if when;
ze-he-še, since; *heva*, if, in case;
ox, although;

and many others. But, as stated, they are omitted from some dependent clauses.

Examples of the Subordinate Verbal Form in the Intransitive State:

ze-vō-sán-etto, it-who-sees I; I, who see;
ze-vō-san-étto, it-who-sees thou;
ze-vō-san-sz, it-who-sees one;
ze-vō-san-ezes, the seeing one;
ze-vō-san-ez, we-who-see;
ze-vō-san-es, you-who-see;
ze-vō-san-ess, the seeing ones;
ze-vō-san-evoz, they-who-see.

Above is the present form. Other tenses simply insert a temporal infix. Only in the past tenses is there a change in the suffixes of the third person singular and plural; thus: *ze'-vō-sans*, when he saw; *ze'-vō-san-e-vos*, when they saw. The third person singular and plural have both a common exclusive form which is characterized by the suffix *-ts*; thus, *ze-vō-san-e-ts*, he who sees. Example:

e-me-ha-ox-ce-hō-mo-hōn *ve-kse-o* *zis-ta-vō-san-ets*
he-would-always strike (is related) bird as saw-he (not the other)

he would strike the bird as it (the bird) opened its eyes.

Were not this in the exclusive form, the Cheyenne could not know who opened the eyes, the striker or the bird.

Examples of the Transitive State:

1. Active voice with personal suffixes:

ze-vō-mo, he-whom I see; *ze-vō-mŏz*, he-whom thou seest;
ze-vō-moz, he-whom one sees; *ze-vō-móz*, he-whom we see;
ze-vō-mos, he-whom you see; *ze-vō-mo-voz*, he-whom they see;
ze-vō-mo-ts, he-whom he sees (excl.).

Above is the present. The past changes the second person singular from *ze-vō-mŏs* to *ze'-vō-mos;* the third person singular becomes also *ze'-vō-mos*, and the third person plural becomes *ze'-vō-mo-vŏs*. Participial forms are as follows:

ze-vō-mon, the ones I see;
ze-vō-mo-sē, the ones thou, or he, or you see;
ze-vō-mó-zē, the ones we see;
ze-vō-mov-sē, the ones they see.

2. ACTIVE VOICE WITH INANIMATE ACCUSATIVE SUFFIX:

ze-vōx-tom, I, seeing it or the one (inan.) I see;
ze-vōx-tomă, thou, seeing it;
ze-vōx-to, he, seeing it;
ze-vōx-to-maz, we, seeing it;
ze-vōx-to-mass, you, seeing it;
ze-vōx-to-me-vos, they, seeing it;
ze-vōx-tots, they (excl.) seeing it.

All the tenses have the same suffixes.

ze-vōx-to-mo-noz, I, seeing those;
ze-vōx-to-mo-sŏz, thou, seeing those;
ze-vōx-to-sz, he, seeing those;
ze-vōx-to-maz-ēsz, we, seeing those;
ze-vōx-to-mas-ēsz, you, seeing those;
ze-vōx-to-me-vo-sz, they, seeing those.

3. PASSIVE VOICE:

ze-vō-mán-etto, I, being seen;
ze-vō man-étto, thou, being seen;
ze-vō-msz, one, being seen;
ze-vō-man-ez, we, being seen;
ze-vō-man-ess, you, being seen;
ze-vō-mevoss, they, being seen;
ze-vō-mees, the seen ones;
ze-vō-me-zes, the seen one;
ze-vō-me-ts, one, being seen (excl.);
ze-vō-me, the seen one (inan.);
ze-vō-mē-sz, the seen ones (inan.).

4. REFLECTIVE VOICE:

ze-vō-máz-etto, I, seeing myself;
ze-vō-maz-étto, thou, seeing thyself;

ze-vō-maz-z, one, seeing one's self;
ze-vō-maz-ez, we, seeing ourselves;
ze-vō-maz-ess, you, seeing yourselves;
ze-vō-maz-evoz, they, seeing themselves.

Examples of other forms:

ze-vō-maz, I, seeing thee;
ze-vōm-etto, thou, seeing me;
ze-vō-masz, one, seeing me;
ze-vō-ma-ez, he or they, seeing us;
ze-vō-ma-ta, he or they, seeing thee;
ze-vō-maz-es, I, seeing you;
ze-vō-mess, you, seeing me;
ze-vō-ma-evoss, they, seeing me;
ze-vō-ma-ezē, the ones who see us;
ze-vō-ma-ess, he or they, seeing you.

As stated, the prefix can change, but the suffixes remain the same for all tenses, states, and modes. There are only slight changes for past tenses, as mentioned. The attributive meaning is the only cause for change in the subordinate suffixes; for instance:

ox-vō-san-ettosz, sollte ich sehen;
ox-vō-mosz, sollte ich ihn sehen;
ox-vōx-to-mo-noz, sollte ich es sehen;
ox-vō-san-éttosŏz, solltest du sehen;
ox-vō-san-ēsz, sollte er sehen;
ox-vō-san-ez-ēsz, sollten wir sehen;
ox-vō-mo-zēsz, sollten wir ihn sehen;
ox-vō-san-esēsz, solltet ihr sehen;
ox-vō-mo-sēsz, solltet ihr ihn sehen;
ox-vō-san-evosz, sollten sie sehen;
ox-vō-mo-vosz, sollten sie ihn sehen.

Pronouns take also the subordinate verbal form. Example:

ze-nē-hóv-etto, I, the one;
ze-nē-hov-sz, he, the one;
ze-nē-hov-ess, you, the ones;
ze-nē-hov-étto, thou, the one;
ze-nē-hov-ez, we, the ones;
ze-nē-hov-evoz, they, the ones.

ni'-no-ká-etto, I, the one, alone;
ni'-no-kas, he alone;
ni'-no-kaess, you alone;
ni'-no-ka-ets, he or they alone (excl.);
ni'-no-ka-étto, thou alone;
ni'-no-kaez, we alone;
ni'-no-ka-evos, they alone;
ni'-no-katto, it alone;
ni'-no-ka-vosz, those alone (inan.).

nis-tóxetto, all of me ;
nis-to.xs, all of him ;
nis-tŏ-xess, all of you ;
nis-tŏ-xe-ts, all of him or them (excl.).
nis-to-xétto, all of thee ;
nis-tŏ-xez, all of us ;
nis-tŏ-xe-vos, all of them ;

Verbal nouns can be formed from all the tenses, states, and modes of the Coordinate form, except the Imperative, Hortative, Hypothetic, Narrative, and Locative modes. The Subordinate Verbal Form does not allow formation of nouns.

A thorough knowledge of the Subordinate Verb makes its syntax comparatively easy. The Cheyenne delights in using participial forms ; in the sacred language and in oration they are very profuse. In common daily conversation the hypothetic and locative modes are much used, especially by women. Story-tellers always use the narrative mode.

General Character of Cheyenne Speech

In connected speech the Cheyenne aims to bind into a sentence whatever belongs together, somewhat like the French "liaison." For instance : *na-vō-mo hetan*, I see a man, is pronounced *na-vō-mô-tan*. There is no special accentuation in the words, unless emphasis is given. The Cheyenne is very careful of the syllables ; the rest takes care of itself. Hence to know the value of every syllable and to speak that plainly and rather slowly without a break in the sentence is considered *old correct Cheyenne*.

The younger generation is unconsciously influenced by the English, and there is a gradual tendency to use detached particles and careless forms. There is no marked dialectic difference in the different Cheyenne bands, in Oklahoma and in Montana, although the latter are slightly influenced by the Sioux. The Sotaeo [Sutaio] now incorporated by the Cheyenne, seem to have had a dialect of their own, but not making an altogether different language. The remnant of so-called Sota words show the same roots and verbal forms that we find in the Cheyenne. Old men or women claiming to be Sotaeo and using Sota forms cannot furnish an example of a word which has not a Cheyenne root in itself.

In religious ceremonies, the rites, not the words, are of most importance. Recent religious influence, either from the Messiah belief or the "mescal bean" [peyote] brought more prayers, songs, and speeches into the religious life, but without enriching the language or bringing out archaic forms. Obsolete and archaic forms are found in old prayer formulas and incantations. Certain archaic forms are used by certain bands or secret organizations and are known only to themselves. Investigation in that line will show however that such words are few in number and have little importance.

And now to close this sketch I give a few examples of Cheyenne as it is spoken in daily intercourse, and as used in prayers, in chanting, and in telling stories:

In Daily Intercourse

Han e-šē-va na'-von-eoz-e-ham na ze-ox-eš ha-ex-ove-
That (by) day I (did) lose-horses mine and although-long-time-

nox-ze-vō-mon na-saa-xa-ma-ton-še-ho-e-o-to-he-o; mo-no-ma'z-
seeking-by look them I-not at-all-manage-come to-them (not) possibly-stolen

tō-evo mato-heva-mo-von-eoz-evo! Ta-xa nita-ze-oxz-he-mă o-he
they are also-or-possibly-lost-became they! let (say!) we-will-there-go to-river

mo-ho-no-vō-mos ze'-nhē-e-vos nae-no a'-to-no hox-ze-ze-va
must not-see-you them as-they-stood there under tree

mo-ho-mō-va-evo!
must have sought shelter from rain!

In Prayers

Ze-vo-vo-a-étto maheo ze-he-mans-tō-ne hetto naeše-a-man,
Thou, the first God, Thou, the maker of our sun,

nat-ho-toxka-ma-neo na-vo-a-man na na'-tho-a-man, ze-heš-he-nis-
our stars, our cloud, and our earth, as Thy

one-to-ve-me-no-notto, hae! ni-a-no-ši-va-ta-me-tan o-ve-me-no
children we are, oh! Thou-down in merciful thought upon us

zex-omo-mo-ena-to-vaze-me-notto! Ni-t'sē-he-kone-vos-tane-ma-ne-
the ones who wailing pray to Thee! Thou-indeed-strong lived makest Thou

o-ses-to ze-to-hetae-ha-oe-na-to-va-ta-o, ve-hō-me-me-no ze-heš-ha-
them all who pray-unto Thee, look at us as we are

o-me-nez, ze-heš-oha-oe-ze-ta-no-na-vo-o-me-nez na ze-heš-saa-
in misfortune, as-we-greatly distressed are and suffer and as- (we) no-

he-pavo-mox-tas-to-ve-hez ! *Ze-heš-hes-zhe-kone-vos-tan-ehev-stov-*
good health have as ours ! As (Thou) the strength of life of ours Thou

sto-va-ze-me-notto hae ! *vis-tae-me-me-no !*
art unto us oh ! help us !

In Chanting

Ševe-mo-hēoxz-hē-ē-ē-nis-ťi-xes-ē-ē-ē *esé-von* *eš-ho-e'nē-ē-ē !*
Hurry-and-gather together ! all-of you buffalo have come !

In Telling Stories

Ex-maso-vēno-veŏ, *e'-niš-ōn* *kase-heeo* *e'vehone-kaš-gone-vōn.*
There was a camp, two they were young girls they chief's children they were.

Na *kas-ova* *ex-ho-a-nōn* *ze-ha-ea-ezes.* *Na* *neš* *es-tose-*
And young-man he liked the one, the old one. And then he-going

ase-veoz-eō *es-ta-hoxe-hoe-otōn* *na* *es'-ze-to-hōn:* *na-tose-*
to start on war. He-comes-(for)-last-meet-her and he-thus tell her, "I going-

ase-ve-oz, *na-ze-evha-hoe'n* *ese-von* *ma-ōno-vax-sz* *ex-heto-hōn.*
start-war-(path), I-shall back come in buffalo when-he-comes out," he-told to her.

Na *neš* *es-tanš-hova-nē-he* *āe* *ze-oxēs-ots* *na* *neš* *hootor*
And then he-(was at) gone absent { year / winter } the length of it, and then suddenly

ze-heš-haha-ne-xov-ets *ze-tos-eš-evha-ho-e'ns,* *yeto* *kase-he* *si-toxc*
as-near time it came he-was-(to) back come this young girl rope

eš-hes-ta-na-nō, *ma-tā* *es-ta-se-he-vava-ehō.* *Na* *veheš-evava-e-vŏs*
she took woods she-went-to-swing. And as she swung to and fro

ex-ne-mene-ō *e-veho-oto-vōn* *kas-ovao.* "*Ese-von* *ma-ōno-vaxsz*
she sang, she sung to him young man. "Buffalo when-out he comes,

na-ze-evha-ho-e'n, *na'-hetā* *kas-ova*" *eše-še-veho-eō.* *Vezen*
I shall-back-come, to me he said young man," she-would sing. Just then

heva-mó *ene-eš-hoe'neō* *kas-ova* *e-emō-ma-evo-hōn,* *na*
possi-bly he-is a coming young man, he-was-seen-in thought by her and

zeheš-éne-eva-vaevos *ea-na-no* *he-vava-hes-tovă* *na*
as-finished she had swung she took down her-swing and

enx-hooxz-eō. Etc., etc.
she-was-coming home.

CANTONMENT,
OKLAHOMA.

INDEX TO VOLUME I

ABBOTT, —, cited, 179, 186
ABERT, J. W., cited, 378, 419
ABORTIONS, statistics of, 252–253, 268 et seq.
ACORNS, how prepared, 158
ADOBE WALLS, battle of, 391
ADOPTION by Cheyenne, 375, 416
ADORNMENT. See *Ornaments.*
ADULTERY among the Paez, 324
AFRICA, northern, head form of Jews in, 13, 14
AGRICULTURE of Northwestern tribes, 156, 176
— of the Paez, 321–322
AHWAHHAWAY. See *Amahami.*
AISORES, head form of, 14, 138
—, nose of, 109
ALCEDO, A. DE, cited, 313
ALGERIA, proportions of sexes in, 257 et seq.
—, cranial index of Jew from, 14
—, Jews from, in New York, 17
ALLEN, J. A., cited, 183
ALGONQUIAN affinity of Cheyenne, 376, 419
— elements in Chinook myths, 201
ALLOTMENTS to Cheyenne and Arapaho, 401
ALSACE-LORRAINE, Jews in, 8
—, pigmentation of children in, 124
ALSBERG, M., cited, 135
ALSEA, transformer in mythology of, 200, 201
AMAHAMI possibly the Owuqeo, 371
AMBER, history of, in Asia, 211–244
AMERICAN and European Jews compared, 19, 20
AMMON, O., cited, 13, 14, 21, 38, 53, 75, 132
AMORITE and Jewish admixture, 135, 140
AMORITES described, 12
AMULETS, amber used as, 224
ANDREE, RICHARD, cited, 6, 7, 10, 12
ANNUITIES granted Cheyenne, 389
ANTS and amber, 220, 222, 227
ANUTCHIN, D. N., cited, 31, 39
AO MÊN CHI LIO cited, 242
AORTA BAND. See *Heviqsnipahis.*
APACHE, Cheyenne name for, 426
—. See *Kiowa Apache.*
ARABIA, amber in, 232
ARABIAN and Jewish admixture, 9
— mention of hsi amber, 222
ARABIANS, proportions of sexes of, 257 et seq.
—, physical characters of, 136
ARAPAHO and Cheyenne friendliness, 367, 372–377
— at Custer massacre, 396
— at Ft Laramie treaty, 379, 389
— at Medicine Lodge treaty, 388
—, Cheyenne name for, 424
— gathered at Ft Supply, 391
— hostilities in 1874, 391–392
— land allotment, 401
—, no clans among, 409
— placed on Shoshoni res., 397
—, population of, 394–395, 402
— raids in Kansas, 389
— sent to Ft Marion, 394
ARCHELAUS cited, 227
ARCHEOLOGY of Northwest coast, 199
ARENDT cited, 215, 218
ARGENTINA, proportions of sexes in, 258 et seq.
ARICAREE FORK, battle of, 390
ARIKARA and Cheyenne friendliness, 367, 373
— at Ft Laramie treaty, 379
—, Cheyenne name for, 423
—, Cheyenne trade with, 366
ARMENIANS, cephalic index of, 14
— descended from Hittites, 138
—, nose of the, 109
ARMISTEAD, *Maj.* L. A., cited, 381
ARMOR of Northwestern tribes, 170, 190
ARROWS, sacred, of the Cheyenne, 370, 414, 417, 420
—. See *Weapons.*
ART of Northwestern tribes, 172–175, 190–191
—. See *Ornaments.*
ARUTINOFF cited, 14
ASHKENAZIM defined, 7
—, cranial index of, 15
—, hair color of, 16
ASIA, amber in, 211–244
ASSINIBOIN alliance with Cree, 364

— and Cheyenne enmity, 375
— at Ft Laramie treaty, 379
—, Cheyenne name for, 421
ASSYRIAN monuments, racial types represented on, 6
ATHAPASCANS, coast, houses of, 176
—, ornamented shirts of, 192
ATKINSON, *Gen.* H., on the Cheyenne, 376
ATSINA, Cheyenne name for, 422
AUSTRALASIA, proportions of sexes in, 258 et seq.
AUSTRIA, Jews from, in New York, 17
—, physical traits of children of, 11
—, pigmentation in, 124
—, reports of births in, 255
AWAQAWI. See *Amahami.*

BADEN, pigmentation of children in, 124
—, stature of Jews in, 13
BADGER, a Cheyenne, 405
BALDNESS among Jews, 128
BALDWIN, *Lieut.*, defeats Cheyenne, 393
BALTIC PROVINCES, stature of Jews in, 13
BANCROFT, H. H., cited, 386, 387
BANNOCK, Cheyenne name for, 422
BASKETRY of Northwestern tribes, 161–162, 174, 187, 191
BASSANOVITCH cited, 84
BATES, *Capt.*, defeats Cheyenne and Arapaho, 392
BAVARIA, degeneracy of urban type in, 39
—, physical traits of children of, 11
—, pigmentation of children in, 124
—, reports of births in, 255
—, stature of Jews in, 13
BEADS, how made by Mandan, 368
BEADWORK among Cheyenne, 415
— among Northwestern tribes, 191
BEARD, Cheyenne medicine-man, 413
BEARDS, color of, in Jews, 126
—. See *Hair.*
BEAR TONGUE, a Cheyenne, 405
BEAVER taboo among Cheyenne, 404
BEDDOE, J., cited, 15, 39, 109
BEES and amber, 218–222, 235, 238
BEGGING DANCE, 424
BELGIUM, reports of births in, 255
BELODIED cited, 83
BENGAL, amber in, 229
BENT BROTHERS, 376, 382
BENT, CHARLES, Indian trader, 382
BENT, GEORGE, biography of, 429
BENT, WILLIAM, 376–377, 382–383, 386–387
BENTEEN, *Capt.*, in Custer massacre, 396
BENT'S FORT, 376, 381, 382, 419
BENZINGER cited, 111
BERBER and Jewish admixture, 9
BERTILLON, A., cited, 99
BIBLIOGRAPHY of Jewish anthropometry, 141
— of Northwestern tribes, 204
— of the Cheyenne, 428
— of vital statistics, 299
BIG JAKE, a Cheyenne, 369, 406
BIG OWL, Cheyenne medicine-man, 413
BIRTH, proportions of sexes at, 245–300
BIZOT, EMILE, cited, 310
BLACKFEET, Cheyenne name for, 422
—, depredations by, 182, 183, 188
— hostility toward Shoshoni, 195
—, Sutaio not a band of, 370
BLACKFOOT SIOUX, Cheyenne name for, 423
BLACK HILLS, Cheyenne in, 365, 366, 370, 376, 380
BLACK HORSE wounded, 394
BLACK KETTLE, a Cheyenne, 385, 390
BLANKETS of Northwestern tribes, 166–167
—. See *Clothing.*
BLECHMAN, B., cited, 8, 21, 50, 60, 73, 75, 108
BLONDNESS among Jews, 11, 12
—. See *Pigmentation.*
BLUE HORSE, Hevhaitaneo chief, 405
BLUEJAY in Northwestern mythology, 200
BLÜMNER, H., cited, 222
BOAS, FRANZ, acknowledgments to, 5
— cited, 6, 10, 45, 139, 152, 154–157, 160, 162–164, 166–171, 173, 175, 192, 200, 201
BOUSER, cited, 385
BOSNIA, cephalic index of Jews in, 15
—, hair color of Jews in, 15
BOURKE, J. G., cited, 395–397
BOWS. See *Arrows, Weapons.*
BOWSTRING SOCIETY. See *Himanatohis.*
BRACHYCEPHALY. See *Cranial index, Head form.*
BRACKENRIDGE, H. M., cited, 402
BRADBURY, J., cited, 366, 402
BREECH-CLOUT of women, 167, 188
BRENNSOHN cited, 83
BRETSCHNEIDER, E., cited, 218–224, 228, 230, 234–238
BRIDGES of the Paez, 320
BROCA, PAUL, on Jewish admixture, 8
BROUGHTON cited, 168
BROWNE, S. E., cited, 385
BRUSSELS, stillbirths in, 267
BRYCE cited, 365
BULL BEAR surrenders, 393
BUFFALO-CAP MEDICINE, 369–370, 417–418

BUFFALO hunting by the Northwestern tribes, 183, 184
— products, trade of, in Northwest, 193
BUKOWINA, blondness of Jews in, 12
—, stature of Jews in, 38, 136, 137
—, stature of Roumanians in, 38
BULGARIA, physical traits of children of, 11
—, proportions of sexes in, 257 et seq.
BURIAL. See *Mortuary customs.*
BURMESE amber, 216–218, 233–239
BURMITE defined, 216

CADDO, Cheyenne name for, 426
— taken to Colorado, 384
CALOTO, destruction of, 313
CAMAS among Northwestern tribes, 157, 176, 178, 181
CAMPBELLS, Indian traders, 382
CAMP-CIRCLE of Cheyenne, 402
CANAANITE and Jewish admixture, 135
—, color of hair of, 126
CANENAVISH identified, 373
CANNIBALISM in Colombia, 327
CANOES of Northwestern tribes, 163–165, 171, 172, 176–178, 187
— used as coffins, 171
CARDINAL POINTS, symbolism of, 411
—. See *Orientation.*
CARR, *Gen.* E. A., defeats Cheyenne, 391
CARSON, KIT, cited, 386
CARVER, J., cited, 373
CARVING by Northwestern tribes, 173
—. See *Art, Images, Stonework, Woodworking.*
CASHMIR, amber in, 225–226, 229, 232
CASTILLO Y OROZCO, E. DEL, cited, 305 et seq.
CATACOMB, ancient Jewish skulls found in, 138
CATLIN, GEO., visits Matotopa, 366
CAUCASIA, head form of Jews in, 13, 138
—, stature and pigmentation of Jews in, 132, 140
CAYUSE, buffalo hunted by the, 183
—, relationships of, 198
—, trade of, 193, 194
CEDAR GROVE, Cheyenne chief, 407
CENTRENOSE, Umpqua chief, 176, 177
CEPHALIC INDEX and racial intermixture, 137
— of Jews. 70–92
— of Jews of Galicia, 12
— of Jews and non-Jews, 14
—. See *Head form.*
CEREMONIAL organization of Cheyenne, 411
CHAA, Cheyenne so called, 361, 363, 365
CHAGUYENNE identical with Hevhaitaneo, 374
CHAMBERLAIN, A. F., cited, 192
CHANG JU-LIN cited, 242
CHANTRE, E., cited, 138
CHAO JU-KUA cited, 219, 232
CHAVANNES cited, 223, 225, 231, 239
CHEHALIS (Tsihalis), transformer in mythology of, 200
—, images of the, 173
CHÊNG LEI PÊN TS'AO cited, 223
CHÊNG YÜN cited, 225
CH'ÊN, TSANG-CH'I cited, 224
CHEROKEE, Cheyenne name for, 426
CHEST GIRTH of Jews, 50–56
CHEYENNE grammar, sketch of, 443–478
— Indians, memoir on, 357–442
CHEYENNE SIOUX. See *Wotapio.*
CHICHA, use of, by Paez, 314, 324
CHIEFS among the Owuqeo, 371
— among Cheyenne, 402–403
— hereditary among Northwestern tribes, 156, 180
CH'IEN HAN SHU cited, 218, 225
CHIHALIS. See *Chehalis.*
CHILDREN, German, pigmentation of, 121, 123, 125
—, Jewish, color of hair and eyes, 11
—, Jewish, precocity of, 51
CHIMAKUAN tribes, culture of, 154
—, habitat of, 198
CHINA, amber in, 215 et seq.
CHINAMAN, Cheyenne name for, 427
CHINESE mention of hsi amber, 222
CHINOOK and Shahaptian hostilities, 196
—, armor of the, 170
—, arrows of the, 169
—, baskets of the, 162
—, basket designs of the, 174, 175
—, boxes of the, 161
—, burial customs of the, 190
—, canoes of the, 163, 172
—, carving by the, 172–173
—, clothing of the, 167, 177, 189, 203
—, coast trade of the, 193
—, culture of the, 153, 154
—, habitat of the, 198
—, hats of the, 166
—, head-flattening among, 154, 155
—, houses of the, 159, 185
—, images of the, 172–173
—, ornaments of the, 168
—, paddles of the, 165
—, mythology of, 200, 201
CHIU T'ANG SHU cited, 231
CHIVINGTON MASSACRE, 384–386
CH'I WAN LIN cited, 244
CHI YÜN cited, 225
CHOCTAW, Cheyenne name for, 427

CHOLERA epidemic among Indians, 378
CHOUSA identical with Hotamitaneo, 374
CHOUTEAUS, Indian traders, 382
CIRCUMFERENCE of head of Jews, 92–94
CITY AND COUNTRY, ratios of sexes in, 294
CLALLAM, dog-hair blankets of, 167
CLAN SYSTEM absent in Northwest, 156
—, extent of, among Indians, 409
CLARK, BENJ., biography, 430
—, cited, 398, 404–406, 409, 420
CLARK, G. W., cited, 234
CLARK, *Lieut.*, captures Little Wolf, 400
CLARK, W. P., cited, 363, 366, 372, 373, 409, 413
CLIMATE, head form not influenced by, 137
CLOTHING of Northwestern tribes, 156, 165–169, 177, 178, 187–189
— of the Cheyenne, 374
— of the Paez, 316
CLUBS of Northwestern tribes, 169–170
—. See *Weapons.*
COCA, use of, by Paez, 316, 322–323
COLLEY, *Agent* S. G., cited, 384, 386
COLLINS, *Lieut.-Gen.*, in fight with Cheyenne, 387
COLOMBIA, Paez Indians of, 301–356
COLOR. See *Pigmentation.*
COLORADO, Cheyenne troubles in, 384, 390
—, gold discovery in, 382
COLUMBIA VALLEY, tribes of, 151–209
COMANCHE at Medicine Lodge treaty, 388
— attacked by Cheyenne, 377
—, camp-circle of, 410
—, Cheyenne name for, 425
— defeated in 1874, 393
— hostility in 1874, 391, 392
—, no clans among, 409
— surrender in 1875, 394
COMFORT, A. J., cited, 367
COMPLEXION. See *Pigmentation.*
COMRADESHIP among Cheyenne, 416
CONNECTICUT, proportions of sexes in, 256 et seq.
—, reports of births in, 254
CONNER, *Gen.*, fight with Arapaho, 387
CONSUMPTIVES, Jewish, stature of, 53
COOK, JAMES, cited, 163, 166, 169, 172
COOKING by Northwestern tribes, 183
—. See *Food, Utensils.*
COOLEY, *Comm'r*, cited, 386
COPPER implements of Northwestern tribes, 170
CORN, habitat of, 321
— raised by Cheyennes, 373
COSSACK and Jewish admixture, 9
COURANT, M., cited, 242
COUREL, H., cited, 215, 228
COUVREUR cited, 222
COVILLE, F. V., cited, 179
COWLITZ, baskets of the, 162
COX, R., cited, 154, 156, 169–171, 180, 182, 183, 185, 189, 190, 195
COYOTE as transformer and trickster, 200, 201, 202
—, See *Himoiyoquis.*
CRADLES, beaded, of Nez Percés, 192
— of Coos Bay Indians, 176, 178
CRANIAL TYPE. See *Cephalic index, Head form.*
CRAZY DANCE among Cheyenne, 415
CRAZY HORSE, fights of, 395, 396
CREE, Cheyenne name for, 421
—, Hudson's Bay Co. among, 364
—, ornamented shirts of, 192
CROOK, *Gen.* G. H., in Sioux campaign, 395
CROWS at Ft Laramie treaty, 379, 389
—, Cheyenne name for, 422
CTESIAS cited, 226
CULBERTSON, T. A., cited, 367, 378
CULTURE areas of Washington and Oregon, 152
— hero of Cheyenne, 417
—, Indian, not ancient, 420
CUMMING, *Supt.*, cited, 380
CUNNINGHAM, A., cited, 229
CUSHITE and Jewish admixture, 135
CUSTER, *Gen.* G. A., in Cheyenne fight, 390–391
CUSTER MASSACRE, 396

DANCE, begging, of Ponca, 424
— of the Paez, 324
DARLINGTON, Okla., agency, 391
—, Cheyenne fight at, 394
—, Cheyenne surrender at, 393
DARLINGTON, *Agent*, cited, 391
DARWIN, CHARLES, cited, 87
DAVIS, *Col.*, in Cheyenne-Arapaho campaign, 393
DAVIS, J. B., cited, 15
DEATH-RATE, statistics of, 269 et seq.
DEGENERACY of urban types, 39
DE LA BARRE cited, 365
DELAWARES, Cheyenne name for, 426
DENIKER, J., cited, 8, 37, 45, 71
DENMARK, proportions of sexes in, 259 et seq.
—, reports of births in, 256
DENTALIA used in trade, 193
—, value of, 168
DENVER, Colo., founded, 382
DENVER, *Comm'r* J. W., cited, 381
DESCENT among Northwestern tribes, 156, 175
DESSAU cited, 14

DEVELOPMENT, physical, of Jews, 52
DEVÉRIA, E., cited, 233
DISEASE among the Paez, 315
DISTRICT OF COLUMBIA, reports of births in, 254
DIXON, R. B., cited, 167, 169
DOBBS cited, 369
DOG HAIR used for blankets, 167
DOG MEN. See *Hotamitaneo, Masikota.*
DOG SOLDIERS refuse peace, 388
— of Cheyenne, 406–407, 412
— in battle, 391
DOGS domesticated in Northwest, 156
— used by Cheyenne, 375
DOLE, *Comm'r,* cited, 383
DOLICHOCEPHALY. See *Cranial index, Head form.*
DOMSIVISTS, Sutaio culture hero, 417
DOOLITTLE cited, 225
DORSEY, G. A., cited, 179, 404–407, 413, 418
DORSEY, J. O., cited, 152, 175, 199
DOUGLAS, DAVID, cited, 151, 176–178, 181, 190
DOWNING cited, 385
DU CHESNEAU cited, 365
DU HALDE cited, 236
DULL KNIFE, 397–400
DU LUC cited, 365
DWELLINGS of the Paez, 318
DYBOWSKY cited, 16, 60
DYER, *Agent,* cited, 401
DYES made by the Paez, 318
DZĪTSI'STÄS, Cheyenne tribal name, 361, 362

EAGLE in Northwestern mythology, 200
EATERS. See *Omisis.*
EDOMITES, color of hair of, 126
EELLS, M., cited, 152–173, 191
EGYPTIAN and Jewish admixture, 9, 10
— monuments, racial types represented on, 6
EICHOLTZ, E. R., cited, 19, 133
EITEL cited, 222
ELECTRUM in India, 227
ELKIND, A. N., cited, 12, 14, 19, 27, 30, 34–36, 48, 52, 60, 67, 70, 73, 75, 77, 81, 82, 83, 86, 87, 91, 108, 115–119, 121, 132, 133
ELLIS, HAVELOCK, cited, 87, 114
EMIGRANTS, white, effect of, on Plains tribes, 379–380
ENGLAND, proportions of sexes in, 257 et seq.
—, reports of births in, 255
—, stature of Jews in, 43
EUROPE, proportions of sexes in, 257 et seq.
EUROPEAN amber in Asia, 241–243
— Jews, eastern, physical anthropology of, 5–146
EVANS, *Gov.,* cited, 385, 386
EVANS, *Supt.* JOHN, cited, 384
EXCHANGE. See *Trade.*
EYES, color of, in Jews, 11, 12, 16
—. See *Pigmentation.*

FACE of Jews, 95–98
FARRAND, L., cited, 152, 154–156, 170, 171, 174, 177, 200, 201
FARRAND AND KAHNWEILER cited, 160, 200
FARRINGTON, O C., cited, 218, 223, 224
FEASTING among Cheyenne, 416
FEATHER ORNAMENTS of Northwestern tribes, 168–169
FEATHERS among Cheyenne, 363
—. See *Ornaments.*
FINERTY, J. F., cited, 396, 397
FINLAND, proportions of sexes in, 260 et seq.
—, reports of births in, 256
FINN and Jewish mixture, 8
FIRE dance among Cheyenne, 415
— used in woodworking, 164
FISHBERG, MAURICE. Physical anthropology of eastern European Jews. 5–146
FISHING by Northwestern tribes, 157, 158, 183
FITZPATRICK, T., Cheyenne agent, 378
FLATHEADS, no canoes among, 187
—, buffalo hunting by, 183
—, Cheyenne name for, 422
—, prisoners killed by, 180
FOOD of Northwestern tribes, 156–158, 176, 178, 180–184
— of the Paez, 321
—. See *Cooking.*
FOOLISH DOGS. See *Hotamimasaw.*
FORMOSA, amber in, 241
FORSYTH, *Col.,* in Cheyenne war, 390, 391
FORT CONCHO, Texas, 392
— CRÈVECŒUR in 1680, 363
— HARKER, Kansas, 389
— KEARNEY, Neb., 380, 385
— KEOGH, Mont., 400
— LARAMIE treaty, 377, 378, 389
— LARNED, Kansas, 388
— LYON, Colorado, 383
— MARION, Fla., 394
— RENO, Okla., 398
— ROBINSON, Neb., 398, 399
— SEDGWICK, Colo., attacked, 386
— SILL, Okla., 393, 394
— SUPPLY, Okla., 390, 391, 393
— WISE, Colorado, 383, 384, 385
— ZARAH, Kansas, 390

FRANCE, birth in, during war and peace, 295
—, proportions of sexes in, 257 et seq.
—, reports of births in, 255
FRANCHÈRE, G., cited, 154, 155, 159, 163, 164, 170, 183, 189
FRANCINCENSE a substitute for amber, 226
FRANKE, O., cited, 226
FRANKEL, LEE K., acknowledgments to, 5
FRECKLES among Jews, 129
FRÉMONT, J. C., cited, 378
FRENCH among Indians, 363, 364
—, Cheyenne name for, 427
FRIEDERICI, G., cited, 420
FROGS of gold from Colombia, 310

GAGATE, references to, 222–224
GAIRDNER cited, 185
GALIANO, D. A., cited, 166
GALICIA, blondness of Jews in, 12
—, cephalic index of Jews in, 80–85, 89, 91
—, comparative anthropology of, 12
—, comparative statures in, 37, 38
—, face of Jews in, 99
—, girth of Jews in, 50, 55, 56
—, head form in, 76
—, head form of Jews in, 13, 60–64, 67, 69, 94, 131
—, height of Jews in, 27
—, immigrant and resident Jews in, compared, 34, 35
—, length of head of Poles in, 59, 61
—, nose of Jews in, 102–109
—, pigmentation in, 124, 125
—, pigmentation of Jews of, 116–119, 122, 126, 131
—, stature of Jews in, 21, 33, 36, 40, 47, 56, 136, 137
—. See also *Ruthenians.*
GALL, in Custer massacre, 396
GALLATIN, A., cited, 419
GARBE, R., cited, 226
GARRARD, L. H., cited, 378
GASS, P., cited, 185
GATSCHET, A. S., cited, 152, 178–180, 186, 193
GEISSLER, A., cited, 296
GENS DE VACHE identified, 373
GEORGIANS, head form of, 138
—, nose of the, 109
GERMAIN FAMILY massacred, 393
GERMANS, cephalic index of, 14
—, stature of, in Hungary, 31
GERMANY, blondness of Jews in, 12
—, composition of Jews in, 9
—, features of Jews in, 7, 8
—, head form and pigmentation of Jews in, 132
—, stature of Jews in Baden, 38
—, physical traits of children of, 11
—, pigmentation in, 121–125
—, proportion of sexes in, 259 et seq.
—, variation in stature in Baden, 21
GHOST DANCE among Cheyenne, 401, 418, 420
GIBBON, *Col.*, in Sioux campaign, 395–396
GIBBS, GEO., cited, 151–173, 180–196
GILES'S DICTIONARY cited, 218, 239
GIRTH of chest of Jews, 50–56
GLASS made into beads, 368
GLÜCK, L., cited, 15, 16, 127
GNATS in amber, 227
GOLD OBJECTS in Colombia, 306–307, 310
GOLDSTEIN cited, 50, 55
GORDON, *Capt.*, cited, 388
GOULD cited, 21, 22, 26
GRAMMAR, Cheyenne, sketch of, 443–478
GRANDE RONDE, a trade center, 193
GRASSERIE, R. DE LA, cited, 336
GRAVES, ancient, in Colombia, 306–307, 310
GRAY BEARD surrenders, 393
GRAYNESS of hair among Jews, 128
—. See *Pigmentation.*
GREAT BRITAIN, degeneracy of urban type in, 39
GREAT RUSSIANS, brunettes taller than blonds among, 133
—, length of head of, 59
GREECE, proportions of sexes in, 257 et seq.
GREEK and Jewish admixture, 9, 10
GREEKS descended from Hittites, 138
GREENWOOD, *Comm'r* A. B., cited, 381
GRINNELL, G. B., cited, 370, 404–407, 411, 414, 420
GROSVENTRES, Cheyenne name for, 422
— confused with Sutaio, 370
GUANACOS Indians of Colombia, 312

HAIDA, canoes of the, 172
HAIR, color of, in Jews, 11, 12, 15
—. See *Pigmentation.*
HAIRDRESS of the Cheyenne, 374
— of Northwestern tribes, 168
HAIRY BAND. See *Hevhaitaneo.*
HAI YAO PÊN TS'AO cited, 219
HALE, H., cited, 151, 154, 180–183, 197, 419
HALF CHEYENNE band. See *Sutaio.*
HAMY, E. T., cited, 14
HANCOCK, *Gen.* W. S., destroys Cheyenne village, 388
HAN PAO-SHÊNG cited, 219
HARDIMAN, J. P., cited, 216
HATS of Northwestern tribes, 165
HAWORTH, *Agent*, cited, 391, 393

HAYDEN, F. V., cited, 364, 367, 419–426
HAYOKA dancers of the Sioux, 415
HAYT, *Comm'r*, cited, 397, 399, 400
HEAD-DEFORMATION in Northwest, 154, 178, 180, 203
— absent in S. W. Oregon, 175, 178
HEAD FORM dependent on race and heredity, 137
— of Jews, 13, 57–92, 137–139
—, relation of, to stature and pigmentation, 130, 133
—. See *Cephalic index.*
HELM, OTTO, cited, 216
HENELY, *Lieut.*, defeats Cheyenne, 394
HENNESSEY, PATRICK, tortured, 392
HENRY, ALEX. See *Henry-Thompson Journals.*
HENRY-THOMPSON JOURNALS cited, 154, 159, 161, 169, 172, 173, 175, 178, 189, 194, 197, 363, 367, 368, 371, 373, 375, 419
HERALDIC SYSTEM of Cheyenne, 417
HEREDITARY chiefs in Northwest, 156, 180
— nobility in Northwest, 156
HEREDITY and head form, 137
—, stature transmitted by, 44
HESSE, pigmentation of children in, 124
HEVHAITANEO, account of, 405, 411
—, migration of, 376
HEVIQSNIPAHIS, account of, 404, 411
HIDATSA, Amahami incorporated by, 371
— at Ft Laramie treaty, 379
—, Cheyenne name for, 423
HIGH WOLF, Cheyenne warrior, 387
HILAMAS, extinct Colombian tribe, 306
HIMATANOHIS, account of, 413
HIMMEL cited, 38, 84
HIMOIYOQIS, account of, 412
HIRTH, FR., cited, 215, 219, 228, 231, 232, 238
HISIOMETANEO, account of, 406
HITTITE and Jewish admixture, 135
HITTITES, Jews descended from, 138
HIVE BAND. See *Hevhaitaneo.*
HOAG, *Supt.*, cited, 393
HODGE, F. W., cited, 426
HOG, a Cheyenne, 397
—. See *Wild Hog.*
HOLLAND, cranial index of Jews from, 14, 15
—, proportions of sexes in, 259 et seq.
—, reports of births in, 256
HOME LIFE of Cheyenne, 418
HOOF RATTLE. See *Woksihitaneo.*
HOOKER, J. D., cited, 230
HORSE MEDICINE DOCTORS among Cheyenne, 414
HORSES among Northwestern tribes, 179, 182–184, 188, 194, 195
—, Cheyenne raids after, 366
—, effect of, on trade, 193, 194
HOTAMIMASAW, account of, 413
HOTAMITANEO, account of, 412
HOU HAN SHU cited, 231–233, 235
HOUGH, W., cited, 170
HOUSES of Northwestern tribes, 157, 159–160, 172, 176, 178, 185–186
— of the Cheyenne, 368
HOWNONA, account of, 407
HSI AMBER described, 222–225
HSIEN SHU cited, 237
HSIN T'ANG SHU cited, 232
HSÜAN TSANG cited, 228
HUACAS in Colombia, 306–307, 310
HUAN YÜ CHI cited, 240
HUDSON'S BAY Co., early operations, 364, 366
HUNGARIANS, head form of, 76
HUNGARY, cephalic index of Jews in, 80, 84, 89
—, face of Jews of, 97, 98
—, girth of Jews in, 55
—, head-circumference of Jews of, 94
—, height of Jews in, 27
—, immigrant and resident Jews compared, 34
—, Jews from, in New York, 17
—, length of head of Jews in, 60, 61, 64
—, nose of Jews in, 102–106
—, physical traits of children of, 11
—, pigmentation of Jews of, 117, 122
—, proportions of sexes in, 259 et seq.
—, stature of Jews in, 33, 35, 37, 47
—, width of head of Jews of, 67, 69
—. See *Magyars.*
HUNT, W. P., among Cheyenne, 376
HUNTING by Northwestern tribes, 158, 182

IDAHO, culture areas of, 153
IKOF, K. N., cited, 9
ILLEGITIMACY, sex proportions accordng to, 277
IMITATIONS of amber, 243-244
IMMIGRANTS, Jewish, physical characters of, 30, 32, 34, 35
IMPLEMENTS of Northwestern tribes, 186, 199
—. See *Utensils.*
INDIA, amber in, 225–229
—, proportions of sexes in, 257 et seq.
INDOGERMANIC JEWS, origin of, 11
INTERMIXTURE, effect of, on stature, 33
— of Jews and non-Jews, 135, 137

— of Northwestern tribes, 198–199
— of races, 6
IOWA HABITAT in 1680, 364
IRELAND, reports of births in, 255
IRON IMPLEMENTS of Northwestern tribes, 170
IRON SHIRT, a Cheyenne, 404
IRVING, W., cited, 376
IRWIN, *Agent*, cited, 397
ITALIANS, cephalic index of, 14
—, variation in stature of, 21
ITALY, cephalic index of Jews in, 15
—, cranial index of Jews of, 15
—, hair color of Jews in, 15
—, proportions of sexes in, 257 et seq.
—, reports of births in, 255
—, stature of Jews in Turin, 13
IVANOWSKI, A. A., cited, 14, 19, 31, 36, 59, 61, 83

JACKSON, HELEN H., cited, 400
JACOB, K. G., cited, 215, 218, 222, 238
JACOBS, JOSEPH, acknowledgment, 5
—, cited, 7, 10, 15, 16, 43, 75, 109, 110, 126
JAMES, *Agent*, cited, 380
JAMI UL HIKAYAT cited, 240
JAMUNDIES Indians, 306, 312
JANKO cited, 19, 84
JANSE, L., cited, 296
JAPAN, amber in, 222
—, proportions of sexes in, 257 et seq.
—, reports of births in, 255
JASCHKE cited, 231
JENSEN cited, 138
JET, uses of, 220, 223–225
JET AMBER defined, 221
JEWESSES, cephalic index of, 72, 85–92
—, length of head of, 58, 62
—, stature of, 45–49
—, width of head of, 66, 68
JEWITT, J. R., cited, 166
JEWS, physical anthropology of, 5–146
JICARILLAS, Cheyenne name for, 425
JOHNSON, *Capt.*, captures Dull Knife's band, 398
JOLLY cited, 229
JOSEPHUS cited, 111
JOUTEL cited, 425
JUDT, J. M., cited, 10, 12, 55

KALAPUYA, culture of, 153, 178, 202
—, sweat houses of, 176
—, trade of, 194
KÄMPFER, E., cited, 222
KANE, PAUL, cited, 151, 154, 161, 167, 170, 181, 183, 186, 194
K'ANG HSI cited, 225
KANINAVISH identified, 373
KANSA, Cheyenne name for, 425
KANSAS, Cheyenne raids in, 381, 388–389
—, Cheyenne peace in, 387
—, Indian raids in, 389–390
KAPPLER, C. J., cited, 383, 401
KARAITE skulls examined, 9
KAW. See *Kansa.*
KEANE, A. H., cited, 99
KEYES, *Capt.*, captures Cheyenne, 393
KHORASSAN, amber imported by, 240
KHOTAN, amber in, 240
KICHUA. See *Kitšua.*
KICKAPOO, Cheyenne name for, 426
KIOWA and Cheyenne friendliness, 374, 379
— and Cheyenne hostility, 376, 377
— at Medicine Lodge treaty, 388
—, camp-circle of, 410
—, Cheyenne name for, 425
— hostility in 1874, 391, 392
—, no clans among, 409
—, peyote rite among, 418
—, shields, 412, 417
— surrender in 1875, 394
— threaten Bent's Fort, 381
KIOWA APACHE and Cheyenne alliance, 378
— at Medicine Lodge treaty, 388
KITŠUA Indians of Colombia, 312
—, sun-worship by, 324
KLAMATH, culture of the, 179
—, houses of the, 186
—, scalping by, 180
—, trade of the, 193
—. See *Lutuamian.*
KLIKITAT, baskets of, 162, 174, 175, 191
—, movements of, 195, 196, 197
KO CHIH CHING YÜAN cited, 239, 240, 244
KO KU YAO LUN cited, 244
KOLLMANN, J., cited, 139
KOPERNICKI cited, 31, 36, 51
—. See *Majer and Kopernicki.*
KÖPPEN, FR. TH., cited, 240
KOPTIC and Jewish admixture, 9
KOREA, amber in, 222, 243
v. KÖRÖSY, J., cited, 11, 296
K'OU TSUNG-SHIH cited, 219
KROEBER, A. L., cited, 160, 169, 175, 176, 409, 414
KUANG CHI cited, 239
KUANG YA cited, 234, 235
KUCHA, amber from, 241
KUMBUM, amber in, 230
KUNG CH'AI cited, 237
KUNZ, G. F., cited, 222
KUTENAI, ornamented shirts of, 192
KWALHIOQUA, culture of the, 154
—, habitat of the, 197

LA FLESCHE, F., cited, 410
LAGNEAU, G., cited, 9

LAME BULL, Fire dance leader, 415
LANGUAGE, Cheyenne, 443–478
—, Cheyenne, materials on, 419
— of the Paez, 327–356
LAOS, early products of, 233
LA SALLE visited by Cheyenne, 363, 365
LASSEN cited, 229
LATHAM, R. G., cited, 419
LAUFER, B. Historical jottings on amber in Asia, 211-244
LAUFER, H., cited, 229
LAWRENCE, W. R., cited, 228, 229
LEA, *Comm'r*, cited, 380
LEAVENWORTH, *Agent*, cited, 386–388
LEE, *Capt.* J. M., Cheyenne agency in charge of, 400, 401
LEE AND FROST cited, 157, 170, 185
LEGGINGS of Northwestern tribes, 167
—. See *Clothing.*
LEGITIMACY, sex proportions according to, 276
LEI HSIAO cited, 220, 224, 244
LEI SHIH cited, 221
LENGTH of head in Jews, 57–64
v. LENHOSSÉK, M., cited, 274
LEPCHA, ornaments of the, 230
LESGHIANS, head form of, 138
—, nose of the, 109
LE SUEUR, post built by, 365
LETTO-LITHUANIANS, cephalic index of, 14, 84, 85, 91
—, pigmentation of, 118, 119
—, stature of Jewesses among, 49
—, width of head of, 67, 70
—. See also *Lithuanians.*
LETTS, cephalic index of, 82, 83
—, stature of, 30
LÉVI, S., cited, 229
LEWIS, A. B. Tribes of Washington and Oregon, 147–209
LEWIS AND CLARK cited, 151, 157–161, 164–172, 175, 180–195, 365, 366, 370, 374, 402
LIANG KUNG TZŬ CHUAN cited, 223
LIANG SHU cited, 227, 228, 233
LIANG SSU KUNG TZŬ CHI cited, 223
LI HSIAO cited, 223
LI HSÜN cited, 219
LINSCHEID, G. A., cited, 420, 436
LI SHIH-CHÊN cited, 217, 221, 223, 224, 228, 238, 244
LITHUANIA, cephalic index of Jews in, 80–85, 89–91
—, comparative statures in, 37
—, face of Jews of, 97, 98
—, girth of Jews in, 50, 55
—, head circumference of Jews of, 94
—, length of head of Jews in, 60, 61, 64
—, nose of Jews in, 102–109
—, pigmentation of Jews of, 115–122
—, stature of Jews in, 13, 33–36, 47–49
—, head form of Jews of, 67, 69, 70
LITHUANIANS, head form of, 59, 76
—, pigmentation of, 123
—, stature of, 30
—. See also *Letto-Lithuanians.*
LITTLE RAVEN, Cheyenne chief, 372
LITTLE ROBE, son of, killed, 400
LITTLE ROCK (Indian), cited, 390
LITTLE RUSSIA, cephalic index of Jews in, 80–85, 87, 89–91
—, comparative statures in, 37, 38
—, face of Jews of, 97, 98
—, girth of Jews in, 55
—, head circumference of Jews of, 94
—, length of head of Jews in, 60–63
—, nose of Jews in, 102–109
—, pigmentation of Jews of, 115–119, 121, 122
—, stature of Jews in, 12, 13, 33–36, 47–49, 136, 137
—, width of head of Jews of, 67–70
LITTLE RUSSIANS, cephalic index of, 84, 85, 91
—, head form of, 76
—, length of head of, 59
—, pigmentation of, 118, 119, 123
—, stature of, 30
—, width of head of, 68, 70
LITTLE WOLF surrenders, 399–400
LIVI, R., cited, 15
LIZARDS in amber, 227
LOMBROSO, C., cited, 13–15, 138
LONE WOLF, a Cheyenne, 369, 370, 406, 407
LORD, J. K., cited, 151
LOREE, *Agent*, cited, 384
LUMMI, dog-hair blankets of, 167
LUN HÊNG cited, 218
v. LUSCHAN, F., cited, 12, 138
LUTUAMIAN and Shahaptian similarities, 196
—. See *Klamath, Modoc.*
LUXEMBURG, reports of births in, 256

MCGILLYCUDDY, *Agent*, cited, 400
MACKENZIE, ALEX., cited, 372
MACKENZIE, *Col.*, in Indian campaign, 392-393, 396
MAD WOLF, a Cheyenne, 369
MAGNETIC property of amber, 218–221, 231
MAGYARS, cephalic index of, 84
—, stature of, 31, 37
—. See *Hungary.*
MAHOHIVAS, account of, 412
MAINE, reports of births in, 254
MAINGKYINA, center of amber industry, 237

MAINOFF, I. I., on Russian-Yakout intermixture, 6, 10
MAJER AND KOPERNICKI cited, 12, 14, 19, 27, 30, 35, 38, 50, 52, 59–61, 63, 69, 70, 81, 91, 108, 109, 117, 119, 121, 125, 127, 131
MAKAH, baskets and mats of, 163
—, coast trade of, 193
—, culture of, 153, 154
—, dog-hair blankets of, 167
—, hats of, 166
—, head-flattening by, 155
—, implements of, 164
—, mode of burial by, 171
—, paddles of, 165
—, slave hunting by, 154
—, war-clubs of, 169
—, whaling by, 157
MALLERY, GARRICK, cited, 367
MANDALAY, amber in, 242
MANDAN and Cheyenne friendliness, 367, 373
— and Cheyenne hostilities, 366
— at Ft Laramie treaty, 379
— bead-making, 368
—, Cheyenne name for, 422
MANIPOS Indians of Colombia, 312
MANKATO, Le Sueur's post near, 365
MAN SHU cited, 238
MARRIAGE among Cheyenne, 410
— among the Paez, 314
MASIKOTA, account of, 406, 411
MASON, O. T., cited, 161–163, 187, 189, 192
MASSACHUSETTS, proportions of sexes in, 256 et seq.
—, reports of births in, 254
MATERIAL culture of Northwestern tribes, 156
MATOTOPA, Cheyenne chief, 366
MATS of Northwestern tribes, 159, 163, 178, 185, 186
MAURER, F., cited, 8, 9
MAXIMILIAN cited, 366, 413, 419, 422–424
MAYR, G., cited, 11
MEDICINE, amber used in, 220, 224, 225, 230, 236
—, saffron used in, 228
MEDICINE LODGE, treaty of, 388
MEDICINE-MEN of the Cheyenne, 381
— of the Paez, 325
MEDICINE SOCIETIES of Cheyenne, 414–415
MÉLY, F. DE, cited, 215, 228
MERRILL, *Lieut.* LEWIS, cited, 381
MESSIAH CRAZE among Cheyenne, 401
MEXICAN, Cheyenne name for, 427
MEXICO, Cheyenne raids in, 379
MICHIGAN, proportions of sexes in, 258 et seq.
—, reports of births in, 254
MICTURITION of Paez girls, 314
MIEN FAN HSIN CHI cited, 237
MIEN HSÜN K'AO LIO cited, 237
MIEN HSÜN SO CHI cited, 237
MIGRATION of the Cheyenne, 363
— of Northwestern tribes, 192–199
MILES, *Agent* J. D., cited, 391–395, 400, 401
MILES, *Gen.* N. A., cited, 393, 396, 397, 400
MILLER, *Agent* R. C., cited, 381, 382
MILNE-EDWARDS cited, 6
MINAKATA, K., cited, 216
MINITARI. See *Hidatsa.*
MINK in Kathlamet mythology, 201
MINNESOTA, Cheyenne in, 363, 368
MISTAI-VIHINOT. See *Masikota.*
MIXED-BLOODS among Cheyenne, 402
MOCCASINS, Cheyenne, 416
— of Northwestern tribes, 167
—. See *Clothing.*
MODOC, culture of the, 179
—. See *Lutuamian.*
MOISEO, Cheyenne name for, 427
—, neighbors of Cheyenne, 368
MOLALA relationships, 198
MONGOLIAN types among Russian Jews, 10
MONINIEO, a women's guild, 415
MONSONI identified with Moiseo, 369
MONTANA, Indian battles in, 395
—, Cheyenne and Arapaho in, 389
—, Cheyenne sent to, 400
MOONEY, J. The Cheyenne Indians. 357–442
—, cited, 195
MOORE, *Agent,* cited, 378
MORGAN, L. H., cited, 151, 408
MOROCCO, Jews from, in New York, 17
MORSE, JEDIDIAH, cited, 402
MORTUARY CUSTOMS of Cheyenne, 418
— of Northwestern tribes, 170–171, 177, 178, 190, 203
— of the Kalapuya, 178
— of the Paez, 315
MOTSIYOIF, Cheyenne culture hero, 417
MOURNING CUSTOMS of Cheyenne, 374
MÜLLER, FR., cited, 338
MULTIPLE BIRTHS, sex ratio in, 296
MÜNSTERBERG, O., cited, 222
MURDER, how treated by Cheyenne, 414
MURPHY, *Supt.,* cited, 388, 390
MUSICAL INSTRUMENTS, Paez, 325–326
MUSKRAT in Indian mythology, 201
MUSSULMANS. See *Arabians.*
MUSTARD-SEEDS as test of amber, 218, 220, 221
MYTHOLOGY of Northwestern tribes, 199

NAI KUNG cited, 223
NAMES, tribal, given by Cheyenne, 421
NAN MAN CHI cited, 238
NAVAHO, Cheyenne name for, 425

NEBRASKA, Cheyenne fights in, 387, 390
NEGROES, Cheyenne name for, 427
—, proportions of sexes among, 257 et seq.
NEILL, E. D., cited, 365
NEPAL, amber in, 228
NEPHRITE as tribute to Chinese, 239
— in Burma, 234, 237
— in Samarkand, 240
NEW YORK and European Jews compared in stature, 26–28
—, cephalic index of Jews in, 71–75, 80–82, 90, 91
—, face of Jews of, 97, 98
—, facilities in, for measuring Jews, 16
—, girth of Jews in, 51, 53, 55
—, growth in stature of Jews in, 40–45
—, head circumference of Jews in, 94
—, length of head of Jews in, 60, 63
—, nose of Jews in, 102–108
—, pigmentation of Jews in, 115–117, 121, 122, 125
—, proportions of sexes in, 258 et seq.
—, stature of Jews in, 33–35
—, width of head of Jews of, 67
NEZ PERCÉS and Shoshoni at war, 195
—, arts of, 191–192
—, burial customs of, 190
—, Cheyenne name for, 422
—, clothing of the, 188
—, European articles among, 194
—, houses of, 185, 186
—, trade of, 193
—, use of buffalo by, 184
—, use of roots by, 186–187
NICHOLS, J. B. Numerical proportions of sexes at birth, 245–300
NICIAS cited, 226
NICKNAMES among Cheyenne, 407–408
NISQUALLY, hats of the, 166
NISSEN, H., cited, 232
NOETLING, FR., cited, 216, 229, 234, 237
NOOTKA basket designs, 175
— blankets, 167
— canoes, 163
— carving, 172
— culture, 154, 202
— hats, 165, 166
— houses, 160
v. NORDENSKIÖLD, A. E., cited, 242
NORTH DAKOTA, Cheyenne in, 366
NORWAY, proportions of sexes in, 260 et seq.
—, reports of births in, 256
NOSE of Jews, 99–110, 138
NOTT AND GLIDDON cited, 6
NUMERICAL proportions of sexes, 245–300
NUR EDDIN MOHAMMED UFI cited, 240

OCACHES, extinct Colombian tribe, 306
OCCUPATIONS of Jews, 40–41
ODESSA, stature of Jews in, 13, 37
—. See *Russia.*
ODOR of Paez Indians, 314
OGLALA, Cheyenne name for, 423
OIVIMANA, account of, 405
OJIBWA and Cheyenne hostilities, 367
—, Sioux enemies of, 365
OKINAGAN, houses of the, 185
—, trade of the, 193
OKLAHOMA, Cheyenne battle in, 390
—, Cheyenne depredations in, 398
—, Cheyenne reservation in, 389
OLECHNOWICZ cited, 30
OMAHA, Cheyenne name for the, 423
— dance among Cheyenne, 420
— Dance Society, spread of, 414
OMENS among the Paez, 325
OMISIS, account of, 407, 411
OQTOGONA, account of, 407
OREGON TRAIL, Cheyenne and the, 379
OREGON tribes, 151–209
ORGANIZATION of Cheyenne, 402
—, warrior, of Cheyenne, 412
ORIENTATION of camp-circle, 403
—. See *Cardinal points.*
ORNAMENTS of imitation amber, 243
— of Northwestern tribes, 168, 187–189
— of the Cheyenne, 379
— of the Lepcha, 230
— of the Paez, 316–317
—. See *Art, Gold objects.*
OSAGE, Cheyenne name for, 425
—, torture of captive by, 392
OSSETTS, nose of the, 109
OTO and Missouri, Cheyenne name of, 425
—, early habitat of, 364, 365
OUISY identical with Omisis, 374
OWL EYEBROWS, Cheyenne chief, 407
OWUQEO, account of, 371
—, Cheyenne name for, 427
— exterminated by Cheyenne, 403

PACHECO ZEGARRA, P., cited, 340
PACIFIC RAILWAY SURVEYS cited, 151
PADDLES of Northwestern tribes, 164
PAEZ INDIANS of Colombia, 301–356
PAGLIANI cited, 21, 22
PAINTING among Cheyenne, 417
— among Northwestern tribes, 172–173, 175, 192
—, facial, by the Paez, 317
PAIUTE, Cheyenne name for, 424
PALESTINE, blondness in, in antiquity, 12
—, Jews from, in New York, 17
PALLADIUM of the Cheyenne, 403
PALLADIUS cited, 222
PALMER, H. E., cited, 385, 387
PALMER, JOEL, cited, 194

PALUS and Yakima relations, 195
PAN CHAO cited, 225
PAN KU cited, 225
PANTUKHOF, I. I., cited, 13, 14, 36–37, 53, 54, 132, 138–139, 140
P'AO CHI LUN cited, 220
PAÓS. See *Paez.*
PARFLÈCHES of Northwestern tribes, 186
—, decoration of, 192, 415
—. See *Utensils.*
PARKER cited, 159
PARKER, E. H., cited, 233, 234
PARRISH cited, 176
PAVEÑOS, a Colombian tribe, 306
PAWNEE capture Cheyenne sacred arrows, 418
— Cheyenne name for, 424
PEARSON, KARL, cited, 22, 90
PEI WEI SHU cited, 233
P'EI WÊN YÜN FU cited, 234
PÊN TS'AO cited, 222
PÊN TS'AO KANG MU cited, 217, 219, 228, 235, 238
PÊN TS'AO SHI I cited, 224
PERRIN DU LAC cited, 373
PERSIA, amber in, 233
PETTER, R., biography of, 439
— cited, 369, 409, 412, 420, 424
—. Sketch of Cheyenne grammar, 443–478
PEYOTE rite of Cheyenne, 418, 420
PFIZMAIER, A., cited, 215
PHILADELPHIA, proportions of sexes in, 258 et seq.
PHŒNICIAN and Jewish admixture, 9
PHYSICAL ANTHROPOLOGY of eastern European Jews, 5–146
— CHARACTERS of Cheyenne, 418
— of Northwestern tribes, 155, 199, 203
— of the Paez, 313
PICTOGRAPHS in Colombia, 307–309
PIEDRA DE LOS SACRIFICIOS, 307–309
PIEGAN, Cheyenne name for, 422
PIEH-LU cited, 217, 235
PIGMENTATION of Jews, 16, 111–129
—, relation of, to head form, 130–133
—, relation of, to stature, 132–133
—. See *Blondness, Eyes, Hair.*
PIJAOS. See *Paez.*
PILCHER cited, 377
PITTARD, E., cited, 19, 31, 36, 37, 59, 67, 77, 82–84, 119
PITTIER DE FÁBREGA, H. Paez Indians of Colombia, 301–356
PIUTE. See *Paiute.*
PLANOS DE INDIOS in Colombia, 307–310
PLINY cited, 218, 222–226, 234
POLAND, cephalic index of Jews in, 80–91
—, comparative statures in, 37, 38
—, composition of Jews in, 9
—, face of Jews in, 99
—, features of Jews in, 7, 8
—, girth of Jews in. 50, 52, 55
—, head form of Jews in, 13, 60, 61, 64, 67, 69, 94
—, height of Jews in, 27
—, immigrant and resident Jews compared, 34
—, Jews from, in New York, 17
—, nose of Jews in, 102–109
—, pigmentation of Jews in, 115–119, 121–123, 132
—, stature of Jews in, 13, 33–36, 40, 47, 132, 136, 137
POLES. cephalic index of, 14, 82–85, 91
—, head form of, 76
—, pigmentation of, 118, 119, 123
—, relation of stature to pigmentation in, 133
—, stature of, 12, 30
—, length of head of, 59, 61
—, width of head of, 67, 70
POLYGAMY among the Paez, 314
PONCA, Cheyenne name for, 423–424
POOR PEOPLE. See *Hownona.*
POPULATION of Cheyenne, 399–402
PORCUPINE, a Cheyenne leader, 401
PORCUPINE QUILLS. See *Quillwork.*
PORTER cited, 366
PORTUGAL, proportions of sexes in, 257 et seq.
—, reports of births in, 255
PORTUGUESE Jews, features of, 7, 8
— trade in amber, 241–242
POTLATCH among Northwestern tribes, 155, 156, 160
POTTERY made by Cheyenne, 368
— made by Shoshoni, 186
— objects in Colombian graves, 306–307
PO WU CHI cited, 218, 235
PRICE, *Maj.*, in Cheyenne-Arapaho campaign, 392
PRICHARD, J. C., cited, 6
PRISONERS enslaved by Northwestern tribes, 180
PROMINENT JAWS. See *Oqtogona.*
PROPORTIONS of sexes at birth, 245–300
PRUNNER BEY cited, 12, 14
PRUSSIA, pigmentation of children in, 124
—, reports of births in, 255
PRUSSIAN trade in amber, 241–242
PUBERTY customs of the Paez, 314
PUEBLO, Colo., trading post at, 376
PUEBLOS, Cheyenne name for, 425
PUMPKINS among the Paez, 321–322
PUYALLUP, transformer in mythology of, 200

QUADRUPLE BIRTHS, statistics of, 298
QUANAH in Adobe Walls fight, 392
QUATREFAGES cited, 14
QUICHUA. See *Kitšua.*
QUILEUTE, whaling by, 157
QUILLWORK among Cheyenne, 415
— of Northwestern tribes, 187, 191
—. See *Ornaments.*
QUIMBAYAS Indians of Colombia, 312
QUINAULT basketry designs, 174, 175
— mythology, transformer in, 200

RACCOON in Northwestern mythology, 201
RACE NAMES of Cheyenne, 427–428
RAMSEY cited, 365
RANKE, J., cited, 13, 39, 125
RAUBER, A., cited, 274
RAVEN in Northwestern mythology, 200
RECLUS, E., cited, 311
RED CLOUD noted, 399
RED SHIELD. See *Mahohivas.*
REE. See *Arikara.*
RELIGION of the Cheyenne, 417
— of the Paez, 324
RENAN, E., cited, 10
RESERVATIONS given Cheyenne and Arapaho, 389
RETINITE confused with amber, 239, 241
REYNOLDS, *Col.,* defeats Crazy Horse, 395
RHODE ISLAND, proportions of sexes in, 256 et seq.
—, reports of births in, 254
RICHTHOFEN cited, 238
RIDGE MEN. See *Hisiometaneo.*
RIESS, L., cited, 241
RIGGS, S. R., cited, 362, 415
RIPLEY, W. Z., cited, 10, 31, 39–41, 50, 53, 76, 110, 125, 134
RITTER, CARL, cited, 234, 236
ROBES. See *Clothing.*
ROBINSON, DOANE, cited, 396
ROCHER, E., cited, 233, 238
ROCKHILL, W. W., cited, 230
RODRIGUEZ, MANUEL, cited, 310
ROMAN and Jewish admixture, 9, 10
ROMAN EMPIRE, amber in, 231–232
ROMAN NOSE, a Cheyenne, 388, 390
ROOTS consumed by Northwestern tribes, 157, 158
— used by the Paez, 322
ROSS, J., cited, 159, 170, 180–193
v. ROSTHORN, A., cited, 233
ROUMANIA, cephalic index of Jews in, 80, 82–85, 89
—, comparative statures in, 37, 38
—, face of Jews of, 97, 98
—, girth of Jews in, 55, 56
—, head circumference of Jews of, 94
—, Jews from, in New York, 17
—, length of head of Jews in, 60, 61, 64
—, nose of Jews in, 102–106
—, pigmentation of Jews of, 117–119, 122
—, proportions of sexes in, 257 et seq.
—, reports of births in, 256
—, stature of Jews in, 33, 37, 47, 136, 137
—, width of head of Jews of, 67–69
ROUMANIANS, cephalic index of, 84, 85
—, head form of, 76
—, length of head of, 59
—, pigmentation of, 118, 119
—, stature of, 31, 37–38
—, width of head of, 68
ROYCE, C. C., cited, 383, 388, 389
RUSSIA, classification of Jews in, 18, 19
—, composition of Jews in, 9, 10
—, composition of people of, 18
—, degeneracy of urban type in, 39
—, features of Jews of, 7, 8
—, girth of Jews in, 52, 53
—, height of Jews in, 27
—, immigrant and resident Jews compared, 34
—, Jews from, in New York, 17
—, length of head of Jews in, 60
—, non-Semitic character of Jews of, 9
—, pigmentation of Jews in, 132
—, proportions of sexes in, 260 et seq.
—, stature of Jews in, 21, 40, 43, 132
RUSSIAN and Yakut admixture, 6, 10
— trade in amber, 240
RUSSIANS. See *Great Russians, Little Russians, White Russians.*
RUTHENIANS, cephalic index of, 14, 83, 85
—, length of head of, 59, 61
—, pigmentation of, 118, 119
—, stature of, 12, 30
—, width of head of, 67, 70
—. See also *Galicia.*

SACRED ARROWS of Cheyenne, 417, 420
SACRIFICE, human, by Paez, 311
— of property at death, 171
— of property by the Paez, 315
SAFFORD, W. E., cited, 310
SAFFRON, distribution and use of, 228
SAGE, R. B., cited, 370, 378
ST JULIEN cited, 215, 228
ST VRAIN, C., Indian trader, 376, 382
SALISH, armor used by, 190
—, basketry of the, 162, 174, 175

—, burial customs of, 190
—, culture of the, 153, 179
—, early movements of, 195, 196
— habitat and distribution, 198
—, houses of the, 160, 186
—, paddles of the, 165
—, trade of the, 193
SALMON among Northwestern tribes, 159, 176, 181
— in Chinook mythology, 200
—. See *Fishing*.
SAMARKAND, amber in, 240
SAMPSON, TH., cited, 219
SAND CREEK massacre. See *Chivington Massacre*.
SANFORD, D. A., cited, 419
SANITARY environment and ratios of sexes, 292
SANS-ARCS, Cheyenne name for, 423
SANSKRIT term for amber, 231
SANTA FÉ trade, 378, 379
SAPIR, EDWARD, cited, 174, 200
SARAT CHANDRA DÁS cited, 231
SARSI, Cheyenne name for, 421
SAUK, Cheyenne name for, 426
SAXONY, reports of births in, 255
SAYCE, A. H., cited, 135
SCABBY BAND. See *Hevhaitaneo*.
SCALP CULT of Cheyenne, 420
SCALPING by Northwestern tribes, 180
— by Colorado troops, 386
SCHEFER, CH., cited, 240
SCHEIBER, S. H., cited, 27, 31, 34–37
SCHIANS, Cheyenne so called, 373
SCHIMMER, G. A., cited, 11, 121, 124
SCHLEGEL cited, 225
SCHOFIELD, *Maj.*, in Cheyenne-Arapaho campaign, 393
SCHOOLCRAFT, H. R., cited, 169, 173, 189, 366, 419
SCHOTT, W., cited, 215, 240
SCHUMACHER, P., cited, 177
SCOTLAND, reports of births in, 255
SCOTT, J. G., cited, 216
SCOULER, JOHN, cited, 154, 167
SCYTHIA, wax amber in, 222
SECRET SOCIETIES of Puget Sound tribes, 156
SELECTION by immigration, 34
SEMEDO, ALVAREZ, cited, 236
SEPHARDIM, cephalic index of, 15
— defined, 7
—, hair color of, 16
SERVIA, proportions of sexes in, 257 et seq.
SEX DETERMINATION, period of, 276
SEXES, proportions of, at birth, 245–300
SHAHAPTIAN affected by Shoshoni intrusion, 195
— and Lutuamian similarities, 196
—, basket designs of, 174, 175
—, buffalo hunting by, 183
—, culture of, 179
—, hostility of, 196
—, houses of, 185, 186
SHAHI-YENA, original of "Cheyenne," 362
SHAVE HEAD, a Cheyenne warrior, 381
SHAWNEE, Cheyenne name for, 426
SHELLS used as spoons, 176
SHELTER. See *Houses*.
SHEM, Jews not descended from, 10
SHÊN NUNG PÊN TS'AO CHING cited, 244
SHERIDAN, *Gen.*, in Cheyenne war, 390
— prevents Cheyenne outbreak, 400
SHERMAN, *Gen.*, cited, 390
SHIELDS, Cheyenne, 417, 420
— of Northwestern tribes, 170, 190
— of the Paez, 327
SHIH I CHI cited, 240
SHOSHONI and Nez Percés war, 195
— and Shahaptian hostilities, 196
—, armor used by, 190
—, buffalo hunting by, 183, 188
—, Cheyenne name for, 422
—, clothing of the, 188
—, culture of the, 179
—, food of the, 181–182
—, pressure on, by Blackfeet, 195
—, rafts used by, 187
—, trade of the, 193
—. See also *Snakes*.
SHOUP, G. L., in Cheyenne massacre, 386
SHU WU I MING SU cited, 218
SIBERIA, amber in, 240, 241
SIGN LANGUAGE, Cheyenne designation in, 362
SIOUX and Cheyenne alliance, 372, 377–378
— and Cheyenne hostilities, 365–368, 376
—, Cheyenne name for, 423
—, early habitat of, 363–365
— elements in Chinook myths, 201
— at Ft Laramie treaty, 379
—, Hayoka dance of, 415
— hostility, 389, 392, 395
—, no clans among, 409
—, parflèches decorated by, 192
— treaty in 1868, 389
—, tribes allied against, 364
—, westward movement of, 365
SITTING BULL, 395–398
SKIN. See *Pigmentation*.
SLAVES among Northwestern tribes, 154–156, 180
—, sacrifice of, 171
SLAVONIAN and Jewish mixture, 8, 9
SLAVS, cephalic index of, 77–79
—, length of head among, 59
—, physical growth of, 52
—, relation of pigmentation to head form in, 134

—, relation of stature to pigmentation in, 133, 140
—, stature of, 31
SMALLPOX at Bent's Fort, 376
— of 1837–39, 378
— of 1862, 384
SMET, P. J. DE, biography, 440
— cited, 181, 182, 378
SMITH, *Comm'r*, cited, 391, 393, 395
SMITH, F. P., cited, 215, 221, 228
SMITH, H. I., cited, 169, 186, 189, 195, 199
SMITH, JOHN S., biography, 441
— cited, 386, 419
SMITH, SILAS B., cited, 154, 155, 178
SMITH, THOMAS, cited, 176, 177
SNAKES, houses of the, 186
—. See *Shoshoni.*
SNIGIREW cited, 13, 27, 30, 34, 37, 50, 51, 55
SOCIAL CONDITIONS, development affected by, 39, 44, 52, 136
—, head type not influenced by, 137
SOCIAL ORGANIZATION of Cheyenne, 402
— of Northwestern tribes, 155, 175–176, 179–180
SOCIETIES of the Cheyenne, 412
SONGISH, dog-hair blankets of, 167
SOUTH DAKOTA, Cheyenne in, 365, 366, 373, 376, 400
SPAGNUOLI defined, 8
—. See also *Sephardim.*
SPAIN, features of Jews in, 7, 8
—, proportions of sexes in, 257 et seq.
—, reports of births in, 255
SPINDLE-WHORLS in Colombian graves, 307, 316
SPINNING among the Paez, 326
SQUASHES among the Paez, 321
SSŬ CH'UAN T'UNG CHI cited, 238
STAETAN identified, 370
STATURE affected by social conditions, 136
— and head-circumference compared, 93–94
— of Jews, 12, 21–49, 136
—, relation of, to girth, 53
—, relataion of, to head form, 130
—, relation of, to length of head, 62
—, relation of, to pigmentation, 132, 133
STAUNTON, *Sir* G. T., cited, 242
STEINBERG cited, 84
STEVENS, I. I., cited, 152, 159, 167, 195, 196
STIEDA cited, 8, 60, 73, 81, 82
STILLBIRTHS, records of, 252 et seq.
— statistics of, 261 et seq.
STONE CALF surrenders, 393
STONE-WORK among Northwestern tribes, 190–191, 199
V. STRAHLENBERG, P. J., cited, 240
SUCCINITE, or Prussian amber, 242
SUCKLEY, *Dr*, cited, 195
SUI SHU cited, 233
SU KUNG cited, 223, 231
SUMATRA, seat of amber trade, 232
SUMNER, *Col.*, attacks Cheyenne, 381
SUN-DANCE of the Cheyenne, 369, 403, 417, 420
SUN-WORSHIP in Colombia, 324
SUNG SHIH cited, 241
SU SUNG cited, 220
SUTAIO, account of, 404
—, dialect of, 476
—, early history of, 369–370
— give Sun-dance to Cheyenne, 417
SWAN, J. G., cited, 151–174, 193–196
SWANTON, J. R., cited, 409, 410
SWEAT-HOUSES of Oregon tribes, 176, 178
SWEATSHOPS, effect of, on stature, 41
SWEDEN, proportions of sexes in, 260 et seq.
—, reports of births in, 256
SWITZERLAND, reports of births in, 255
—, skulls from Jewish cemetery in, 139
SYMBOLISM of the Cheyenne, 411
SYNONYMY of the Cheyenne, 361
SYRIA, amber in, 228, 231, 232
—, blondness in, in antiquity, 12
—, Jews from, in New York, 17
SYRIANS, head form of, 138
—, nose of, 109
SZEKLERS, cephalic index of, 84

TABOO among Cheyenne, 404, 414, 417
— among the Paez, 325
— of food, 158
TA CH'ING I T'UNG CHI cited, 221, 237
TAKAKUSU, J., cited, 228
TALKO-HRYNCEWICZ cited, 12, 14, 19, 27, 31, 34–38, 48, 60, 63, 67, 70, 73, 75, 77, 81–83, 87, 91, 108, 109, 114, 116, 117, 119, 121, 125, 134
TALL BULL, a Cheyenne, 391
TALON cited, 365
TAMAHNOUS boards, 173
T'ANG PÊN cited, 224
T'ANG PÊN TS'AO cited, 231
T'ANG SHÊN-WEI cited, 223
T'ANG SHU cited, 233
T'ANG SHU HSI YÜ CHUAN cited, 231
T'AO HUNG-CHING cited, 217, 219, 235, 244
TARTAR and Jewish admixture, 8
TATTOOING among Northwestern tribes, 168, 177
TAYLOR, *Comm'r*, cited, 390

TEIT, J., cited, 162, 167, 179, 185, 190, 194
TERRY, *Gen.*, in Sioux campaign, 395–396
TETON SIOUX and Cheyenne friendliness, 367, 373
TEUTON and Jewish admixture, 9
TEXANS, Cheyenne name for, 427
THOMPSON INDIANS, horses among, 184
—, houses of, 185
—, trade of, 194
TIBET, amber in, 230–231
TIEN LIO cited, 231
—. See also *Wei lio.*
TIERRA ADENTRO, Paez Indians of, 301–356
TIGER'S SOUL and amber, 217, 225
TI LI CHI cited, 220
TILLAMOOK, culture of the, 153
—, habitat of the, 198
—, paddles of the, 165
—, slave hunting by, 154
—, transformer in mythology of, 200
TIPIS, Cheyenne, 368, 415, 417, 420
TLATSKANAI, culture of the, 154
—, habitat of the, 197
TLINGIT, basket designs of, 175
—, canoes of the, 172
—, daggers of the, 170
TOBACCO among Cheyenne, 373
— among Oregon tribes, 176
— among the Paez, 323
TO-CHE-WAH-COO, or Fox Indians, 374
TOKIOUAKOS mentioned, 374
TONKAWA, Cheyenne name for, 426
TOPINARD, P., cited, 8, 27, 99, 107
TORTURE of prisoners, 180, 392
TOTEMIC SYSTEM absent in Northwest, 156
—. See *Clans.*
TRADE in amber, 211–244
— of Northwestern tribes, 192–199
— of the Cheyenne, 375, 376
— of the Kalapuya, 178
TRANSFORMER in Northwestern mythology, 200
TRANSPORTATION among Northwestern tribes, 163
TRAVEL among Northwestern tribes, 163
TREATY with Cheyenne, 376, 378, 383–384
— of Fort Wise, 383
— of Medicine Lodge, 388–389
TRIBUTE, amber as, 222, 233, 239–241
TRIPLE BIRTHS, statistics of, 297
TS'AI HUO YÜAN LIU cited, 244
TS'AO CHAO cited, 221
TSIHALIS. See *Chehalis.*
T'U CHING PÊN TS'AO cited, 220
TUNIS, Jews from, in New York, 17
TURANIAN type of Jews, 8
TURFAN, amber near, 223, 224, 239
TURKEY FEATHERS among Cheyenne, 363
TURKISH term for amber, 231
TURKISTAN, amber in, 239–241
—, gagate in, 224
TURKS descended from Hittites, 138
T'U SHU CHI CH'ÊNG cited, 217 et seq.
TWIN BIRTHS, statistics of, 297
TWISS, *Agent*, cited, 380, 381
TWO-KETTLE SIOUX, Cheyenne name for, 423

UMPQUA clothing and weapons, 177
— houses, 176
— tribal movements, 197
UNITED STATES, Jews in. See *New York.*
—, proportions of sexes in, 258 et seq.
URBAN TYPE, degeneracy of, 39
URICOECHEA, E., cited, 305 et seq.
URUGUAY, proportions of sexes in, 258 et seq.
UTE, Cheyenne name for, 424
UTENSILS of Northwestern tribes, 157, 160–161, 173, 176, 186, 187
— of the Paez, 319

VANCOUVER, GEO., cited, 151, 160, 167–170, 177
VARIABILITY of physical characteristics, 22
— of stature of Jews, 21, 22, 34–35
VERENDRYE, V. DE LA, cited, 373
VIELE, *Capt.*, pursues Cheyenne, 393
VIJEÑOS, a Colombian tribe, 306
VIRCHOW, R., cited, 11, 12, 112, 121–125
VISIONS induced by peyote, 418
VOGT, KARL, cited, 8
VORDERMAN, A. G., cited, 215
VOROB'EFF, V. V., cited, 133, 134

WAEBER cited, 83
WAIILATPUAN culture, 179
— habitat, 198
—. See *Cayuse.*
WALES, proportions of sexes in, 257 et seq.
—, reports of births in, 255
WALKER, R. J., cited, 381
WALLAWALLA, houses of the, 186
— not buffalo hunters, 184
— relations with others, 195, 198
—, trade of the, 193, 194
WANG CH'UNG cited, 218
WANG TS'Ê-CHING cited, 224
WAPATOO among Northwestern tribes, 157

WAR, effect of, on sex ratios, 295
— implements of the Paez, 327
WARRIOR organization of Cheyenne, 412, 417, 420
WASHINGTON, tribes of, 151–209
WASHITA, battle of, 390
WATEFF, S., cited, 11
WATTERS, T., cited, 234
WAX AMBER, 222–225
WAX PALM used by the Paez, 323
WEAPONS of Northwestern tribes, 169–170, 177, 178, 189
WEASEL in Northwestern mythology, 201
WEI LIO identified with Tien lio, 231
WEISBACH, A., cited, 8, 19, 38, 84, 127, 133
WEISSENBERG, S., cited, 9, 10, 21, 27, 34, 36, 43, 52, 60, 73, 75, 81, 87, 91, 108, 115, 116, 121, 125, 127, 128
WELLESLEY COLLEGE, 420
WELLS cited, 176, 177
WESSELLS, *Capt.*, attacks Dull Knife's band, 399
WHALING by Northwestern tribes, 157, 166
WHIRLWIND, a Cheyenne, 392
WHITE ANTELOPE, a Cheyenne, 385
WHITEHEAD cited, 387
WHITE MAN, Cheyenne name for, 427
WHITE RUSSIA, cephalic index of Jews in, 80, 82–85, 87, 89–91
—, comparative statures in, 37
—, face of Jews of, 97, 98
—, girth of Jews in, 52
—, length of head of Jews in, 60–64
—, nose of Jews in, 102–109
—, pigmentation of Jews in, 118–119
—, stature of Jews in, 33–36, 47–49
—, width of head of Jews in, 67–70
WHITE RUSSIANS, brunettes taller than blonds among, 133
—, cephalic index of, 14, 84, 85, 91
—, head form of, 59, 61, 67–68, 70, 76
—, pigmentation of, 118, 119, 123
—, stature of, 30
WHITE SHIELD, a Cheyenne, 392
WHITFIELD, *Agent*, cited, 380
WHITMAN, *Mrs.* M., cited, 180
WICHITA, Cheyenne name for, 426
WIDTH OF HEAD in Jews, 64–70
WILD HOG, a Cheyenne, 398–399
—. See *Hog*.
WILKES EXPEDITION, 151, 157, 170, 178, 180, 181, 183, 185, 193, 194
—. See *Hale, Horatio*.
WILLIAMS, S. WELLS, cited, 241, 243
WILLIAMSON, ALEXANDER, cited, 238
WILLIAMSON, T. S., cited, 362–365
WILLOUGHBY, CHARLES, cited, 163
WILLOUGHBY, C. C., cited, 165
WILMART, J., cited, 254
WINNEBAGO, Cheyenne name for, 423, 426
WISSLER, CLARK, cited, 192
WITCHCRAFT among the Paez, 325
WOKSIHITANEO, account of, 412
WOLF ROBE, a Cheyenne, 369
WOMEN, Cheyenne, status of, 374, 415–416, 418
—, Paez, dress of, 317
—, Paez, status of, 314, 326, 327
WOODWORKING by Northwestern tribes, 157, 164, 172, 199
WOTAPIO, account of, 406
WYLIE cited, 242
WYNKOOP, *Maj.*, cited, 385, 386, 388, 390
WYOMING, Indian fights in, 380, 387, 392, 396

YAKIMA, early movements of, 195–196
—, trade of, 193
YAKONAN TRIBES, clothing of, 165
—, culture of, 154
—, slavery among, 155
YAKOWENKO, M. G., cited, 14, 21, 27, 34–36, 48, 52, 60, 70, 73, 81, 82, 87, 91, 108, 115–117, 121, 127–129
YAKUT, amber dug by the, 241
— and Russian admixture, 6, 10
YEN CHIEN LEI HAN cited, 215
YING YAI SHÊNG LAN cited, 229
YÜ HUAN cited, 231
YUNG CH'ANG cited, 237
YÜNNAN, amber in, 232–239

ZAKRZEWSKI, A., cited, 19, 30, 40, 43

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